THE MEDICAL JOURNAL OF AUSTRALIA

VOL. I.—47TH YEAR SYDNEY, SATURDAY, JANUARY 9, 1960 No. 2

Table of Contents

BLUEPRINT FOR A MODEL PSYCHIATRIC HOSPITAL.[1]

By DAVID C. MADDISON, M.R.A.C.P., D.P.M.,

Senior Lecturer in Psychiatry, University of Sydney,

LADIES AND GENTLEMEN, it gives me very real pleasure to welcome you to this official opening and inspection of our new area psychiatric hospital, in this year of grace, 1999. Those of you whose memories of psychiatric services go back some 50 years, or who are students of the historic literature on the subject, will realize that this unit you are about to see represents the culmination of many years of thought and experimentation concerning the hospitalization of the mentally ill, and brings us to the point where we have finally broken with many of the traditional ideas about the nature and function of the in-patient psychiatric service. It was in the middle years of the present century that the first signs of this change began to appear; you will find plaques commemorating the ideas of such historic figures as Querido, McMillan, Sivadon, Rees and others at various points in the administrative offices.

Perhaps we should first trace the march of events which has led us in this community to our present happy position in relation to our society. The stage has now been reached where service to the mentally ill has become a prestige task, and where the public look at psychiatric illness, by and large, in much the same light as they regard physical disease; gradual changes in our social framework, while regretted by some, have advanced our culture to a stage of maturity wherein the provision of really adequate social services, including those for disabled persons, has become a community responsibility of primary importance. This position was not reached, as you know, without a good deal of effort; 50 years or so ago, psychiatrists suddenly awoke to the fact that the abhorrence in which mental illness was held was only partly due to primitive and deeply determined cultural taboos, and was being at least equally contributed to by the gloom, isolation and conservatism of the mental hospital itself. Systematic and rewarding campaigns of public education were begun at varying levels of sophistication and complexity, and every opportunity was taken to make the public familiar with the aims and methods of psychiatry generally and of psychiatric treatment services—the mental hospital reached out into the community, and the community was brought into the hospital. Such arduous techniques of public relations were pushed ahead despite the protestations of those many doubting Thomases who insisted that the results of such procedures could not be measured statistically, and therefore were not results at all. A full-time officer was employed in the State to devise and implement techniques of closer cooperation between the hospital and the public, and his work, and that of our

[1] Read at the annual meeting of the Australasian Association of Psychiatrists on October 14, 1959.

own staff, is still proceeding in this general field of mental health education, a matter to which all our professional personnel even now devote a small portion of their time. Having then reached the point where we had full public support, adequate financial resources and abundant personnel to develop and staff a model psychiatric service, we now had to devise the type of unit best suited to our real needs.

You will have already realized that our location has been specially selected to ensure full integration within the pattern of the entire medical services for the area. Roughly a mile from our local general hospital, we are close enough to permit full utilization of many of their important facilities—laundry, pathological laboratories, operating theatres, radiological and electroencephalographic equipment, certain aspects of clerical administration common to us both, and so on—yet far enough away to enable us to develop along our own lines, untrammelled by all the various necessary conventions inseparable from general hospital organization. It became apparent many years ago that, because psychiatry was regarded, and of course correctly regarded, as a branch of medicine, we had uncritically assumed that the pattern of a psychiatric service would be best modelled along the lines traditionally followed by medical and surgical units. For a time it became popular to assert that the correct place for a psychiatric ward was as an integral part of a general hospital, built to the same pattern and sharing a similar sort of routine; but this development, useful though it was in breaking down many of the restrictive barriers between psychiatry and other medical disciplines, died a natural death in the 1970's without regrets. On the other hand, the old-fashioned mental hospital had fallen into an even more disastrous groove; because it was of the genus "hospital", one architect after another designed building for psychiatric patients which looked more and more like traditional medical units, and which therefore became more and more unfitted for the real care of mentally sick people. Our present situation was the inevitable and desirable compromise.

Most, though not all, of the larger general hospitals in the State now have units of this type; like this one, they have accommodation for about 200 patients. These are grouped in quite small wards of the cottage type, none holding more than 30 patients, and each containing both male and female beds, with shared dining and recreation space; each cottage prepares its own meals. One ward is used exclusively for the intensive investigation and treatment of geriatric cases on a short-term basis, and a further 20 beds provide a similar type of programme for children and adolescents; the remaining wards admit general adult psychiatric material of all types, suitably graded as to degree of disturbance as soon as possible after admission. We also treat a further 30 to 40 patients on a daily admission basis.

I must stress that admission of a psychiatric patient to hospital, when it is required, forms only one stage in our whole treatment programme, which is community-orientated, and which makes, therefore, every effort to avoid hospitalization and the inevitable complications which follow in its wake. Such a service may begin, in certain circumstances, with domiciliary consultation, if and when this is requested by the local general practitioner; and in any event it makes its major contact through our extensive out-patient department, to which roughly 50% of our total professional staff time is allotted. With extensive use of out-patient investigation and treatment, together with judicious use of daily admission when indicated, we have been enabled to avoid full in-patient care for the majority of neurotics, many senile patients, and many more psychotics than we at first thought possible. It is, in retrospect, a matter for great surprise that this obvious proposition was not grasped earlier throughout the world; doubtless political considerations, and the desire to record the growth of a psychiatric service in terms of bricks and mortar rather than in terms of man-hours and office space, were largely responsible.

To mention briefly the other avenues through which our community orientation functions, these can be summarized by stating that my staff—psychiatrists, psychologists and social workers—are entirely responsible for all public psychiatric services within our geographical territory. We provide an extensive consultative service to our general hospital wards and a weekly out-patient service to the other general hospitals in the area which have no psychiatric unit of their own, and fulfil both the consultative and therapeutic requirements of both the prison and the child welfare institution in our vicinity, both of which are making increasing and important calls upon our services. Child guidance clinics, as they were once called, have been incorporated very largely into our out-patient framework, but we continue to provide quite a sizeable service to our area children's hospital for certain special problems, and in addition are available for consultation to meet the needs of the schools. Some of our staff have regular sessions at the nearest branch of a marriage guidance organization. This complicated pattern of services has, of course, been possible only since the institution of a unified direction for all the psychiatric services throughout the State—a development which was for many years bitterly opposed. To complete the picture, all our senior staff have a limited right of private consulting practice, which, of course, allows us to attract people whom otherwise we might easily lose (even a model psychiatric hospital cannot compete with the financial rewards available to the full-time private practitioner). As a complement to this, many of the psychiatrists in our area give of their own special experience in teaching sessions for our more junior staff on a fee-for-service basis; the resulting free exchange of ideas, we believe, is to our mutual benefit.

It was difficult to persuade the State to finance the construction of these units, despite their relatively low cost, until we could provide it with a workable plan for the utilization of the older type of hospital already in existence; segments of some of these were already close enough to existing first-class general hospitals to be used as units of the type I have described, but the majority, in this State and elsewhere, were inconveniently located and unmanageably large, and built to an architectural design which made them totally unfit for dynamic mental hospital care. These have served a variety of purposes, and with a certain degree of conversion have become geriatric centres (both for patients with senile brain disease and for the non-psychotic senescent patient), mental defective and epileptic colonies, alcoholism units, and psychiatric rehabilitation centres for those patients who remain as the bulk of the unsuccessfully treated of yesteryear and for those relatively few individuals who first consult us now with chronic psychosis and who do not respond to our current treatment procedures. These last-mentioned centres are orientated predominantly towards industrial and other occupational techniques, in one or other of which virtually every patient is engaged. Another older institution has become a valuable addition to the Child Welfare Department's properties, and yet another has been developed along the only lines for which it was really ever fitted by its basic design—namely, as a minimum security prison.

In our new units staff-patient ratios are high by the standards of half a century ago; the community accepted for many years an anomalous situation in which physically ill persons were provided lavishly with medical and nursing care, whereas the psychiatric patient, who above all needed intensive individual and group work with skilled therapists, was relatively starved of personal attention. This quaint mid-century custom has now been rectified. Our present staff comprises 30 medical officers, of whom roughly two-thirds have a specialist qualification—it is important that the most senior psychiatrists have university affiliations as part-time teachers. An appreciable portion of their time is spent in work not directly affecting in-patients, and this same consideration makes it essential for us to employ 12 psychiatric social workers, who are being increasingly used in various

forms of community liaison work, most particularly in our extensive follow-up and rehabilitation programme for discharged patients. One important aspect of this has been the development of our extremely extensive service directed towards patients' relatives; for several decades we mumbled piously that "mental illness runs in families", but did absolutely nothing constructive to cope with this situation, except to carry out the most sporadic attempts at environmental manipulation. Generation after generation of psychiatrists pondered over the high relapse rate in all types of psychiatric illness and, particularly during what has since become known as the "Tranquillizing Sixties", seemed genuinely pained when the newest chemical marvel failed to produce any dramatic change in this pattern of recurrences. Our own approach has, we believe, been much more logically consistent and successful. Our standard procedure is to regard each fresh case of psychiatric illness as a pointer to family abnormality, and to involve the patient's significant relatives in the treatment process in one way or another, as a matter of routine, from the commencement of his contact. Relatives were initially, not surprisingly, somewhat resistant to this development, but, as our tradition developed along these lines, their opposition was overcome more easily than many of us expected. We occasionally admit family groups, or segments of them. Certainly, whenever possible, we admit the very young children of hospitalized mothers.

In many respects the key figures in our treatment programmes for in-patients are the nursing staff, whom you have already seen, but possibly not recognized, as we have not for many years had them dressed in the traditional and quite inappropriate uniforms of their general hospital colleagues—yet another of the traditions which the early psychiatric administrators took over as part and parcel of the general hospital mystique. Maxwell Jones was thought to be a harmless eccentric when he first made the break from custom; but it is now realized that, although the nurse needs occasionally to don an overall to perform a specific clinical task, for the greater part of the time her real role is obscured, rather than furthered, by the habitual impediment of the nurse. I describe them as key figures because, despite our relatively high numbers of medical staff, there is still nowhere near enough time for personal psychotherapy for all who need it, and nurses are still the individuals who have by far the most significant and prolonged contact with the patients, and whose influence is most profound in creating the therapeutic atmosphere of the hospital. In most of our wards, most importantly in the children's and adolescents' service, but elsewhere as well, the ward sister is an integral part of the ward, living in a self-contained unit; and during her flexible hours of duty she participates to the fullest extent in the ordinary living of her patients, taking meals with them, and so on. We have long since adopted the basic pattern of nurse training developed originally in North America, and our trainee nurses stay with us for six months as an obligatory part of their undergraduate training at our parent general hospital. For those who elect a career in psychiatric nursing (and there are many, for this has now become a prestige field), a nine months' post-graduate training programme is provided, slanted towards a full development of their understanding of and skill in interpersonal relationships. In particular, they are trained to a high level of competence in the manipulation of occupation and recreation in all their various aspects as therapeutic tools, thereby superseding the older type of occupational therapist, whose work became redundant in the presence of adequately trained nursing staff.

Our current therapeutic programme is very much in line with this type of thinking, and those of you who have hoped to hear of some new and revolutionary magic which will radically reverse long-established patterns of abnormal behaviour will be, as usual, bitterly disappointed. Certainly this year's batch of pharmaceuticals seems able, better than ever before, to control excitement, diminish hallucinations, remit depression and provide short-term stimulus to the apathetic and retarded, but after our carefully controlled Drug Trial No. 2651 (excluding those many trials carried out with pharmacologically inert substances) we finally reached the conviction that the drug treatment of psychiatric illness can only ever be a palliative and symptomatic remedy for abnormality which grows, in every instance, out of a disturbed capacity for personal relationships and for direct or sublimated instinctual gratifications. Four hundred and eighty-seven different biochemical and neurophysiological abnormalities have now been discovered in schizophrenia, and one or two seem likely to be primary defects in the biological substrate of the schizophrenic patient; but correction of those deficiencies which have shown themselves to be modifiable, while controlling overt symptoms in some instances, has not led to any profound change in the personality organization of the schizophrenic patient, or reversed the damaging effects of his abnormal life experiences. It still seems to be important what sort of parents you have, and how they care for you.

Because we have come to depend less on the symptomatic control of disturbed behaviour, we have tended more and more to see the effectiveness of a psychiatric hospital in terms of its capacity to provide an environment in which patients can learn new patterns of living and obtain more mature gratifications within the framework of cultural restrictions. The American sociologist, Warren Dunham, suggested nearly 60 years ago that there was a "deep-seated flaw" in the administrative design and social organization of the mental hospital, and the later work of Stanton and Schwartz, Bellknap and others, in the years immediately following the last World War but one, suggested very clearly that one of the most important factors in this, if not the most important of all, was the traditional hierarchical power system within the hospital, yet another pattern taken over from the general hospital structure which proved quite unsuitable for the needs of psychiatric patients. The thoughts of Maxwell Jones and Harry Wilmer, amongst others, were helpful in this connexion, though Jones' ideal of a completely permissive hospital environment soon showed itself to be totally unsuitable in the context of the society to which our patients had to return. Nevertheless, the real psychiatric revolution of our time has been not in the chemical or surgical spheres, but in a reevaluation of the dignity and the capacities of psychiatric patients, and in a consequent planning of the hospital environment as a situation in which these capacities can be utilized and strengthened, and those numerous forces which in the past worked against the patient's recovery abolished. Dunham held that, except in the case of physically sick or brain-damaged mental patients, the pressures in the older hospital tending to maintain the patient in a state of illness were twice as numerous as those conducive to maturity and recovery. Even in the better hospitals of 40 years ago, admission was immediately followed by several undesirable consequences: paralysing dependence was fostered, privacy was drastically and often unnecessarily invaded, and personal standards of dignity and self-respect were lowered; precious individuality was whittled down and personal freedom encroached upon, whether or not this was appropriate to the patient's behaviour. To correct these damaging consequences has required a thoroughgoing revision of attitude for all categories of staff, and organization of the hospital into multiple groups functioning at different levels has been essential in this development. Some of the most important of our present groups are as follows:

1. Patient groups within each ward, substantially responsible for policy-making within the ward, and each electing two representatives to the hospital's patients' council, which meets regularly with senior members of the medical and nursing staff to discuss and implement numerous aspects of the hospital's organization, to supervise social and recreational programmes, to frame or alter local regulations, to decide on ways and means of implementing these, and so on.

2. Numerous activity groups, supervised largely by senior nursing personnel, based on tasks suitable for various age or diagnostic groups, but led with deliberate therapeutic intent, in keeping with the nurse's current role as a "nurse-therapist", which is influenced by her intensive training in group dynamics. These activities may be occupational, recreational, social, or a mixture of all three.

3. Therapeutic groups proper, led by a psychiatrist, clinical psychologist or psychiatric social worker, embracing both neurotic and psychotic patients, and with the traditional aims of promoting insightful behaviour and of developing more mature forms of interpersonal relationships.

4. Staff groups for supervision and training at various levels, with the interlocking aims of promoting free communication, ventilating problems in both the administrative and clinical areas, and providing support for less experienced staff members. These occur in varying combinations and permutations: for example, there are regular weekly meetings of trainee nurses with senior nursing personnel, junior medical officers meet with senior psychiatrists, senior nurses meet medical staff, and so on.

5. Community-orientated training programmes, which should be mentioned because they are very much part of our group activities. Many years ago the realization came to early workers in the mental hygiene movement that, as a result of the increasing spread of information about emotional maladjustment, much more comparatively minor psychotherapy was required than could conceivably be handled by any purely psychiatric service, however much it might be expanded. We therefore see it as part of our task to provide training programmes for those people whose occupation places them favourably to detect early emotional disorders, to carry out limited counselling procedures and to influence positively the mental health of their social group. We provide suitable courses for such people, amongst others, as general practitioners, ministers of religion, marriage guidance counsellors, pædiatricians and so on. These people, even more importantly, become our listening posts; we see in our treatment service, as a result, more and more patients with early and comparatively easily reversible emotional disorders. It took stamina in the first half of this century to remain a hospital psychiatrist, and deal almost exclusively with the long-established and often virtually intractable case.

This hospital has become an effective treatment unit, and therefore an interesting and exciting place to work, because—and only because—it is a centre of consistently high morale and enthusiasm. Some of the reasons for this I have already outlined, but the most important one I have left till last. The hospital is one of numerous similar hospitals throughout the State, and as such is part of the State's psychiatric services and is responsible—and I in particular am responsible—to the Director of this service and through him to the elected Government. But this tie for many years has been a loose one; the directions which we take in our clinical and administrative policies, the type and number of staff which we employ and their disposition, the standard of meals we serve and the quality of blotting paper we use—these things and countless others are a matter for local decision, within the broad policy laid down by the Director at his regular conferences with his Superintendents, and within the annual budget allotted to us. Within the hospital, in addition, the Superintendent has long since ceased to be the sole authority responsible for all decisions affecting patient care. Each qualified psychiatrist has his own patients, whether committed or not, and he is regarded as a fully responsible agent in dealing with them, provided, once again, that he is acting within the extremely broad framework of hospital policy. The last 50 years have shown clearly that, more than through any single advance in clinical psychiatry, the lot of the mental patient has been improved by changes in the pattern of health service administration, at all levels from the lowest to the highest.

What are the essential elements in our pattern of development during the last century? Two factors, as I see them, are paramount: on the one hand, we have succeeded in making the psychiatric hospital an essential element in medical services generally, without forcing it to submerge its own identity and special needs; and yet, on the other hand, we have succeeded in creating for it a vital and unbreakable link with the community, to which it is indispensable, and of which the interest and support are indispensable to the hospital's own progress. The mental hospital, for many years, remained right outside the main streams of medical development; Weir Mitchell highlighted this fact when he told a gathering in 1894:

> . . . you began to live apart and you still do so. Your hospitals are not our hospitals. You live out of range of the critical shot; you are not preceded or followed in your work by clever rivals or watched by able residents fresh with the learning of the school.

Though many important changes were made in the structure and function of the psychiatric hospital in the half century following this broadside, it is only now, we believe, that we have been able completely to prove Weir Mitchell wrong.

COMMUNITY PSYCHIATRIC TREATMENT IN AUSTRALIA.

By JOHN M. WOODFORDE, M.B., B.S., D.P.M.,
St. Clement's Hospital, London.

THE last two decades have seen a great change in the attitude of people in all parts of the world who are concerned with the treatment of the mentally ill. This change in attitude has produced an emphasis on the social responsibility of the community for taking part in the treatment of the patient, as seen in Russia, North America, Holland and Great Britain. This has produced, in its turn, such ventures as the Worthing Experiment and the Marlborough Day Hospital, and investigations such as the recent Royal Commission on the Law Relating to Mental Illness and Mental Deficiency in England. It is proposed to discuss the application of some of these changes in ideas, and the ways in which they might apply to Australian society and conditions. This is of great importance, as often there is an actual, as well as an implied, lack of psychiatric facilities, owing to the present services' being confined mostly to a few mental hospitals, typically isolated from the community which they are intended to serve.

Why is it Required?

In the past in Australia, as Dax (1958) has pointed out, it has not been possible to treat many types of mental illness, except by having the patient removed to a mental hospital after certification. More recently there has been a move to encourage voluntary admission, but in spite of an overwhelming and often embarrassing response, it has still been to the mental hospitals. These places are large, with a heterogeneous, largely chronic population, and are isolated both by distance and, also very often, by lack of useful communication with the community.

But mental disease is a reality, and it seems clear that the disorders may be caused by social difficulties as well as being manifested by them. Therefore, it seems more reasonable to treat such difficulties in the community, if possible, rather than to isolate and deny this real problem, and produce further disorder by having the patient removed unnecessarily many miles, sometimes even hundreds of miles, from the source of his trouble and his family. If a person is removed from his home the structure of the home is broken up, sometimes less money comes in, a social stigma is inflicted upon the family, the ranks sometimes close up and further difficulties result when attempts are made to get the patient home and rehabilitated. Crafts (1958) showed at the Maudsley Day Hospital that treatment of the patient in day hospitals

near his home shortened the length of time during which the patient attended hospital, and thus it is sound on economic grounds from the viewpoint of both the patient and the State. Moreover, when it is considered with what ease a patient's relatives and social situation can be brought into the treatment situation for mutual benefit, a further advantage is seen.

The relative proximity of the early treatment centre to his home allows the patient to seek early advice. He can be visited by the psychiatrist in his own home, or attend an out-patient clinic like any other patient, without fear. If he seeks early treatment, his return to efficient social functioning is more prompt, of longer duration and of a better quality than if he had hesitated in seeking advice, and had had a partial spontaneous remission or become chronically ill. This need for early attention is particularly true in the case of elderly patients, whose social situation changes when the old people push the family tolerance beyond its limit; and this makes it difficult, and sometimes even impossible, to get the families to take them home when they have improved sufficiently to go.

What is Required?

The most important recent contribution to social psychiatry which might be applied to Australian conditions is a modification of the service at Worthing, England. This was a two-year pilot experiment providing an out-patient and domiciliary treatment service, based on the town of Worthing, in England. The particular town, somewhat psychiatrically isolated by local standards, was chosen "to show if it is possible to provide psychiatric treatment for large numbers of people without the immediate availability of the resources of a modern mental hospital". An active treatment centre and day hospital is the headquarters of the service, which, using the services of a well-organized psychiatric staff, provides treatment for a diversified population. The psychiatric out-patient clinic at Worthing Hospital is included in the service, and patients are examined there, at the treatment centre, or in their own homes. This allows the patient to be seen promptly, and also permits close liaison with the family doctor. The objective result, in the first ten months, was that there was reduction of 59% in the admission rate from this area to the mental hospital (Carse, Panton and Watts, 1958).

A scheme could be arranged to provide a similar service for many Australian communities, particularly in the more widely scattered country areas. There are many communities which would warrant the provision of such psychiatric staff and their headquarters. The unit of population under discussion here will be taken as a community of 50,000 people. The reasons for choosing a community of this size will be discussed later.

The psychiatric team must cover a wide field, and a high staff-patient ratio is essential. The members of the team would include psychiatrists, psychiatric social workers, occupational therapists and nurses.

The basic requirements for a qualified psychiatric staff would be a full-time specialist in psychiatry and a full-time medical officer of registrar grade as an assistant. The former would be the leader of this local team, and his duties would include conducting clinics at the local general or base hospital, as well as at the treatment centre and also—and I believe this to be one of his most important functions—visiting the patient's home on domiciliary consultations at the request of the patient's own doctor. The assistant would be primarily concerned with the activities of the treatment centre, but would also assist the psychiatrist with his clinics and be responsible for the administration of the physical treatments—electro-convulsive therapy and modified insulin therapy. It might be possible for the medical officer to be a registrar in his second or third year, and for this work to be part of the training programme, on a rotation basis.

The psychiatric social worker is an important member of the team, but as yet is little recognized as such in Australia. Both Stoller (1948) and Stewart-Kennedy (1953) have drawn attention to this deficiency, but there are still many teams which are weak because of the absence of this member. Besides being a liaison worker between patient, psychiatrist and family, the social worker must have diverse contacts with the community, employers, immigration officers, employment offices and other government offices. Even in Great Britain, where there is a higher proportion of psychiatric social workers than in most other places, the number is still considered too small, and a positive move is needed to encourage more people to enter this profession.

Occupational therapists are perhaps slightly more plentiful than the last-mentioned members of the team, but, nevertheless, they, too, are rare, and without them it would be difficult to envisage this scheme. They are undoubtedly limited in their scope in one sense in the plan I envisage, as the patients would tend to be people who needed occupational rather than vocational therapy. But, on the other hand, there is great scope for this type of therapy because it is for these people, who are in need of help in improving their interpersonal relationships, that the centre is intended. In this respect, an evening social club for the patients and some of their relatives would be an extension and continuation of the occupational therapist's activities. Indeed, some patients maintain that they gain as much from the therapeutic social club as from other parts of the treatment programme.

Fortunately, both male and female psychiatric nurses are becoming more plentiful and better trained. There is now a greater emphasis upon the active therapeutic aspects of their work, which is in the nature of social therapy, rather than upon their former role as custodians of the insane. This change in the direction of active personal participation of the therapists is particularly important, as it is envisaged that the type of centre described should treat patients on group therapy lines. It might not be necessary for many of the patients to attend every day, or even all day, and so parts of the week could be arranged to provide for different groups of patients and their special needs, which might result from their age or type of illness. It is not intended that the patients should live in the hospital at night for long periods, as its function might be misunderstood and misused, and it would thus lose its principal asset—namely, flexibility. However, there might be a need for some patients to spend short periods in residence in the hospital, particularly in country areas, as distances are often great in Australia. Possibly, with further increases in staff and with the need which might arise in densely populated areas, the use of the hospital might be extended by a night-treatment plan, or it might even become a temporary hostel or "half-way house" for patients recently discharged from mental hospitals.

I have left the matter of a clinical psychologist until the last, because I doubt whether a full-time psychologist would be needed in a community of the size under discussion. However, if a part-time psychologist was available, he would be of undoubted value as part of the team in such problems as the diagnosis of adult disorders, and particularly in the guidance of parents and children.

The members of the team should be able to work in close cooperation, without the hierarchical difficulties that have existed in other places. This could be facilitated by frequent staff meetings, and free discussion would be encouraged "to allow the essential therapeutic atmosphere to arise".

Where Shall it Be?

There are two aspects of the question "where shall it be?", because it draws attention to the actual physical site of the treatment centre, and also to the community in which it is to operate. The former question is possibly one of the more controversial ones, but I think it may be settled in favour of having the treatment centre as a distinct unit, not in the grounds of a mental hospital or in a general hospital, but, on the other hand, attached by firm lines of communication to both. In such a case the psychiatrist would be a member of the State mental health

service and also a consultant psychiatrist to the general hospital in this area.

There are three good reasons for not situating the treatment centre in the mental hospital. First, there is still the social stigma of the mental hospital, and people would thus tend not to seek early treatment. Secondly, I believe that the mental hospital serves a purpose, in the treatment and care of the long-stay patient, which is by definition different from that served by the early treatment centre. Therefore, it is desirable that the two should be distinct, although closely associated, and that the patient should be treated in the appropriate place. Thirdly, the mental hospitals are often some considerable distance from the community, and an unnecessary strain would be placed on the patient in travelling. A reasonable criterion of proximity seems to be a maximum of 30 minutes' travelling time.

For several reasons the treatment centre should not be in the general hospital. First, although it would be undoubtedly of considerable importance for teaching purposes, these places are already short of space and could not afford to be deprived of any that is urgently needed for their present uses. Secondly, the nursing staff of the general hospital are trained in a different, more authoritarian, way from those needed in a psychiatric unit, and the general hospital administration might intrude, with disastrous results, upon the treatment of the psychiatric patient. Thirdly, few of the patients in the treatment centre would be primarily ill in their bodies; most would be active and so cause more noise to be produced by games, gramophones, etc., than would be tolerated in a hospital with physically ill people. However, close association in the sharing of services for investigation—for example, radiological and pathological—is desirable, as these are often necessary, but expensive, to provide for a relatively small number of patients.

The ideal thing would be to have the centre built for the purpose; but these things are often very expensive, and sometimes a large house in some ground is available and can be converted for the purpose at a fraction of the cost, as was done at the Maudsley Day Hospital. This should have space for offices and rooms for interviewing, for physical treatments (approximately ten beds) and for patients and staff to meet for group discussions, as well as a large room for social activities and occupational therapy.

The second question is the community in which the service is to operate. This necessarily depends upon the population density of the community, because by the very nature of the scheme mobility of staff is an essential. Otherwise, if long journeys for domiciliary visits were made, the working of the scheme would immediately become inefficient. A compromise would have to be made between the availability of staff and the cost of such a scheme, and the pressing need for it in so many places without existing facilities. Some people may even argue that this community is too small to need such facilities, and figures could be produced from many sources giving suggested desirable psychiatrist-patient ratios; but these would vary within wide limits, depending on the function that the psychiatrist is intended to perform. The demand for any service is determined principally by the type and quality of the service provided to cope with this need. It is obvious that there would be sufficient demand for this sort of service in a community of this size when one takes the figures provided by Dax (1958). He estimates that 25% to 35% of the total patient attendances in general practice are of a psychiatric nature, and that from these, 15 new psychotics will be seen each year in a general practice of 2000 people; that is, at the rate of 375 in a community of 50,000. The number of patients seen during the first few months of the Worthing Experiment, by a larger team in a smaller area, was only a small proportion of those estimated to require this service in a community of the size I have in mind, and it was considered to be a most satisfactory beginning there. So it would seem that in a city suburban area or a country city of approximately 50,000 people, such a scheme might be workable and an economic proposition.

Discussion.

"The field of psychiatry is the field of interpersonal relations." This is the trend in psychiatry which was emphasized by Sullivan two decades ago (Sullivan, 1953). He, like Fromm, Horney and others later, laid most of the blame for mental disorder at the door of the culture in which a person lives. Therefore, as a logical sequel, the treatment of the person's mental disorder should be undertaken in the cultural and social setting, rather than only in the seclusive atmosphere of a mental hospital.

In recent years the mental hospitals have become more integrated into being part of the State-wide psychiatric service, with its many centralized specialized departments. In downward focus from this wide view of providing facilities for the society as a whole, a more practical picture appears when attention is paid to the social needs and problems of the individual in his own particular community. There are complex reciprocal relationships between the individual and his family, social, religious, professional and political groups. These vary in both time and place, being a function of the age of the individual and the subculture in which he lives. The particular relationships which the individual has with the members of each group, both singly and as a group, and the relationships which each group has with the others, are of real importance. These can be used effectively in the management of the disorder in its natural context.

In many places psychiatric out-patient clinics have been established, but their effectiveness is reduced by their being required to treat too many patients with inadequate facilities. The community mental health service is an extension of the out-patient clinic, and Harper (1959) recently remarked that "the work of the clinic falls naturally into three parts; diagnosis, therapy, and support and after care". Each of these functions can be easily made more effective by domiciliary visits, about which Carse (1958) made the following statement:

> This constant personal contact with the patient, his family and background and his own doctor has offered us conditions which make possible the practice of individual psychiatry—the ideal of every psychiatrist.

This, in its turn, provides mutual support for all concerned, and it is particularly important in the after-care of the patient discharged from a mental hospital. Often the return of these people to their homes is not a practical proposition, as they can cause severe strain, both emotional and economic, on the other members of the family, who may find that the burden of a sick relative is too heavy to bear. Even when the assistance of the many bodies which aim to help in such circumstances is arranged, the patient may be kept out of hospital only at immense cost to the family and to the State. In such circumstances, when the patient is incapable of conforming to the demands of society sufficiently to remain at home, it is desirable that a source of advice and help be at hand.

Possibly the mental hospitals will not be outmoded, as some extremely optimistic people are suggesting now; but they will play a part as long-stay rehabilitation centres and sheltered workshops—as Dax has suggested (1955)—and so be a further extension of the scheme. An individual becomes a patient in a mental hospital not because he has psychotic symptoms and signs, but because his illness requires treatment there and because he fails to satisfy society's minimum demands. Otherwise, as Atkin (1959) has emphasized, "if no in-patient treatment is indicated and he is harmless, he should remain at home".

The care and support of these people is, then, one of the possible functions of the scheme; Bierer has gone so far as to say that up to 80% of the present mental hospital population could be cared for by attending day hospitals and living at home. In these hospitals they would receive

such therapy as physical treatment, occupational therapy and group therapy in a democratic therapeutic atmosphere, which is intended to foster good interpersonal relationships. In this way we should avoid the frequent ill effects of the patient's adaptation to the mental hospital and the sequestration from his home, which Martin (1955) has described as "institutionalization".

Although this community after-care function would not be the prime purpose of the scheme, it is an important one, not only for the reasons already given, but also because, as Macmillan (1959) pointed out, it has a "beneficial influence on public opinion". On this point Carse (1958) has stated that:

> The success of a district mental health service depends on its public having learnt to accept mental illness as it would any other illness and to seek advice and treatment promptly.

This allows much to be done in the prevention and early treatment of psychiatric disorders, and this is the ultimate aim in any form of treatment.

Much has been done to educate the community by radio and television, newspaper articles, and lectures to groups of people such as Rotary, Apex and the Country Women's Association, informing them of recent advances in the treatment of the mentally ill. But more activity is needed in this direction, because the Australian people, particularly those in country areas, are relatively unsophisticated in psychiatric matters. If we are to have decentralized psychiatric treatment centres, much work will have to be done to change the attitude of "the best is down in the city", which still unfortunately exists, along with the characteristic pervasive attitude of *laissez faire*.

Summary.

A continuing trend for the cause of mental disorder to be sought in disturbed interpersonal relationships has resulted in the placing of greater emphasis on the participation of the community in the treatment of these disorders. A successful experiment at Worthing, England, has been referred to, and a scheme has been put forward to show how such a service could be provided for Australian conditions. The many uses and advantages of such a scheme have been discussed. The finer details concerned in the operation of a particular community service and day hospital have not been discussed, as these would necessarily depend upon the particular needs of the community and upon the staff available.

Acknowledgements.

I should like to take this opportunity to thank for their suggestions all those people with whom I discussed the subject of this paper. I am grateful to Dr. P. H. Tooley, consultant psychiatrist to St. Clement's Hospital, London, for his most helpful advice in the preparation of this paper.

References.

ATKIN, I. (1959), "Why Admit to a Mental Hospital", *Brit. med. J.*, 1: 293.

BIERER, J. (1951), "The Day Hospital", Lewis, London.

CARSE, J., PANTON, N., and WATT, A. (1958), "A District Mental Health Service", *Lancet*, 1: 39.

CRAFTS, M. (1958), "Treatment of Depressive Illness in a Day Hospital", *Lancet*, 2: 149.

CAWTE, J. E. (1957), "Community Care of Mental Illness in North America: Some Observations and Recommendations", MED. J. AUST., 2: 709.

DAX, E. C. (1955), "The Creative Activities in Mental Hospital Treatment", MED. J. AUST., 1: 58.

DAX, E. C. (1958), "The Early Symptoms of the Psychoses in General Practice", MED. J. AUST., 2: 719.

HARPER, J. (1959), "Out-Patient Adult Psychiatric Clinics", *Brit. med. J.*, 1: 357.

HARRINGTON, J. A., and MAYER-GROSS, W. (1959), "A Day Hospital for Neurotics in an Industrial Community", *J. ment. Sci.*, 105: 225.

HARRIS, A. (1957), "Day Hospitals and Night Hospitals", *Lancet*, 1: 729.

MACMILLAN, D. (1958), "Community Treatment of Mental Illness", *Lancet*, 2: 201.

MARTIN, D. V. (1955), "Institutionalisation", *Lancet*, 2: 1188.

HER MAJESTY'S STATIONERY OFFICE (1957), "Royal Commission on the Law Relating to Mental Illness and Mental Deficiency.

STEWART-KENNEDY, R. (1953), "The Beattie-Smith Lectures. Lecture I", MED. J. AUST., 2: 626.

STOLLER, A. (1948), "Social Health and Psychiatric Services", MED. J. AUST., 2: 29.

SULLIVAN, H. S. (1953), "Conceptions of Modern Psychiatry", Second Edition, Tavistock, London.

METASTASIS OF MALIGNANT TUMOURS TO THE ADRENAL GLAND.

By L. J. CUSSEN,

Trainee in Pathology, Royal Melbourne Hospital.

ADRENAL METASTASES are a common finding in post-mortem examinations of patients with malignant neoplasms, but relatively few surveys of the subject appear in the literature. The largest series appears to be that of Edwards and Holland (1954), who briefly reviewed 354 cases of adrenal metastases in a report on adrenal insufficiency. However, they gave no details of the metastases, other than the frequency of occurrence with five different primary tumours. Bullock and Hirst (1953) reviewed 2833 cases of malignant tumour and found 244 adrenal metastases. These were histologically proven in 116 cases, and the authors give a comprehensive review of the site, size, shape and histological features of the cases for which the relevant details are available. Glomset (1938) has published a good analysis of the frequency of adrenal metastases in a series of 821 cases of malignant tumour, excluding gliomata. He found 110 adrenal metastases—an over-all incidence of 13%—and also recorded the incidence of adrenal metastases with various primary tumours. Willis (1952) has reviewed the literature on the subject, and in addition quotes 45 instances of adrenal metastases in a personal series of 500 cases of malignant tumour. He gives an excellent analysis of the features of these cases.

A relatively small amount of information thus appears to be available on this common lesion, and accordingly a survey was made of adrenal metastases seen in the morbid anatomy department of the Royal Melbourne Hospital.

Material and Methods.

The reports of 11,984 consecutive post-mortem examinations performed in the department over the years 1938 to 1957 (inclusive) were reviewed, and a total of 3012 cases was found in which a diagnosis of some form of malignant tumour was made. For the purposes of the survey, gliomata were included in the total, whilst medullary reticulosis, Hodgkin's disease and leukæmias were excluded. Of the 3012 cases, 275, or 9·1%, showed adrenal metastases. The diagnosis was histologically proven in 175 cases, the slides of which (one or more sections stained with hæmatoxylin and eosin) were available for study. The lesions were analysed with regard to the incidence, site, size and number of metastases, to adrenal function and to the age and sex of the patient.

Results.

Incidence.

The incidence of adrenal metastases found in different primary tumours is shown in Table I.

Age and Sex.

The age was recorded for all but 125 of the 3012 patients with malignant tumour, and for 274 of those with adrenal metastases. The age distribution and average age of both groups are shown in Table II. It will be noted that the age distribution and average age of patients with malignant tumours are higher than those of patients with adrenal metastases. In order to obviate the effect of one or more types of tumour with a low or high age incidence,

the figures were further analysed into different tumour types, and the results are shown in Table III. With the exception of patients with carcinoma of the œsophagus and reticulosarcoma, patients with adrenal metastases are younger than the average for any particular type of tumour. No deductions are drawn for tumour types in which less than five cases of adrenal metastases are recorded, as the age distribution could be due to chance alone.

TABLE I.

The Incidence of Adrenal Metastases Found in Association with Primary Tumours.

Type of Tumour.	Number of Cases.	Number of Cases with Adrenal Metastases.	Percentage Incidence of Adrenal Metastases.
Melanoma	42	15	—
Lung	363	125	34
Thyroid	23	5	—
Kidney	39	9	—
Breast	143	18	13
Pancreas	160	13	8
Stomach	435	30	7
Colon and rectum	451	26	6
Œsophagus	100	5	5
Gall-bladder	58	3	—
Reticulosarcoma and lymphosarcoma	93	5	5
Prostate	179	7	4
Bile duct	82	3	4
Sarcoma (various sites)	36	1	—
Skin	40	1	—
Bladder	100	2	2
Uterus	87	1	1
Adrenal	10	2	—
Seminoma of testis	8	1	—
Teratoma	3	1	—
Parotid	3	1	—
Endothelioma	1	1	—
Glioma	228	0	—
Ovary	39	0	—
Liver	36	0	—
Larynx	30	0	—
Myeloma	21	0	—
Tongue	20	0	—
Small intestine	19	0	—
Antrum	12	0	—
Renal pelvis and ureter	11	0	—
Pharynx	10	0	—
Vulva	10	0	—
Others	101	0	—

The sex distribution is shown in Table IV. The apparent discrepancy between the two sets of figures is due to the high incidence of adrenal metastases in carcinoma of the lung. In this disease the sex incidence of all cases was found to be 5·7 males to 1·0 female, and this ratio was reflected in those patients with adrenal metastases, namely, 6·7:1. If cases of carcinoma of the lung are excluded, the sex incidence in both groups is approximately equal.

TABLE II.

Age Distribution of All Patients with Malignant Tumour and of Those with Adrenal Metastases.

Age. (Years.)	All Cases of Malignant Tumour. (Percentage.)	Cases with Adrenal Metastases. (Percentage.)
0 to 9	0·3	0
10 to 19	0·3	0
20 to 29	2·0	2·0
30 to 39	4·7	7·0
40 to 49	12·6	15·0
50 to 59	21·2	31·0
60 to 69	26·6	28·0
70 to 79	24·8	13·0
80 to 89	7·0	4·0
90 to 99	0·5	0
Average	61·5	58·2

Size and Number of Metastases.

The metastases varied in size from 8 cm. in diameter (Case 271) to microscopic dimensions. In Case 271, where both adrenals were involved, the left gland weighed 225 grammes and the right 100 grammes. No deductions were drawn as to the average size of metastases because of a general tendency to record the size of large metastatic tumours, but not of small ones.

TABLE III.

Average Ages of All Patients and of Patients with Adrenal Metastases with Various Types of Tumours.

Type of Tumour.	Average Age of All Patients in Years.	Number of Cases.	Average Age of Patients with Adrenal Metastases in Years.	Number of Cases with Adrenal Metastases.
Melanoma	49·0	42	44·9	15
Lung	59·4	363	57·4	125
Thyroid	62·9	23	60·0	5
Kidney	62·2	59	57·7	9
Breast	58·0	143	52·7	18
Pancreas	64·0	160	58·6	13
Stomach	63·4	435	57·6	30
Colon and rectum	64·5	451	60·4	26
Œsophagus	65·8	100	73·0	5
Gall-bladder	71·3	58	67·0	3
Reticulosarcoma and lymphosarcoma	50·4	93	58·3	5
Prostate	74·8	179	70·1	7
Bile duct	66·2	82	55·3	3
Sarcoma (various sites)	51·1	36	3·0	1
Skin	68·1	40	59·0	1
Bladder	66·4	100	77·0	2
Uterus	58·9	87	53·0	1
Adrenal	58·8	10	64·0	2
Seminoma of testes	48·5	8	77·0	1
Teratoma (retroperitoneal)	43·3	3	30·0	1
Parotid	59·3	3	67·0	1
Endothelioma	72·0	1	72·0	1

Metastases were multiple in 119 cases, in 21 of which a single metastasis was present in either gland, and single and unilateral in 57 cases. In the remaining 99 cases the number of metastases was not recorded.

Site of Metastases.

The distribution of metastases to either adrenal gland is shown in Table V. The higher incidence in the left adrenal may be partly due to the slightly larger size of the left gland. However, in cases of carcinoma of the stomach, 27 adrenal metastases (nearly two-thirds of the total number) were in the left gland, and only 16 (one-third of the total) in the right. This difference accounts for the greater part of the discrepancy noted in Table V. No other primary tumour showed a significant difference in the number of metastases in either gland.

TABLE IV.

Sex Ratio of all Patients with Malignant Tumour and of Those with Adrenal Metastases.

Type of Case.	Male. (Percentage.)	Female. (Percentage.)
All cases	63·5	36·5
Cases with adrenal metastases	72·0	28·0
All cases except those with carcinoma of the lung	60·5	39·5
Cases (except those with carcinoma of the lung) with adrenal metastases	60·0	40·0

The predilection of metastatic growths for the medulla has been noted previously (Bullock and Hirst, 1953; Willis, 1952), and this tendency was confirmed. In a majority of cases, the growths were so large as to preclude any accurate assessment of their point of origin. However, in 99 sections the site of origin could be determined with certainty, as a solitary tumour mass was present; 89 of these were in the medulla and 10 in the cortex—a ratio of approximately 9:1. This predominance of medullary metastases was apparent in all types of primary tumours. It is interesting to note that of the 10 cortical metastases, three were present in cortical adenomata—an association also noted by Willis (1952).

Adrenal Function.

None of the cases reviewed showed clinical evidence of adrenal insufficiency. This is not surprising, in view of the frequent finding of large masses of metastatic tumour surrounded by an attenuated rim of apparently normal adrenal cortex (e.g., Case 271). Edwards and Holland (1954) found only four cases of adrenal insufficiency in 354 cases of adrenal metastases.

Discussion.

The interesting features which emerge from this series are the frequency of adrenal metastases in various types of primary tumour, the site of the metastases, the age distribution of the patients, and the frequency of left-sided metastases in carcinoma of the stomach.

TABLE V.
Distribution of Metastases to Either Adrenal Gland.

Metastases.	Number of Cases.	Percentage of Total.
Bilateral	135	49
Unilateral, left side ..	74	27
Unilateral, right side ..	60	22
Unspecified	6	2

The frequent finding of adrenal metastases in cases of melanoma, carcinoma of the lung and carcinoma of the breast has been remarked by several writers (Edwards and Holland, 1954; Bullock and Hirst, 1953; Glomset, 1938; Abrams *et alii*, 1950), as also has a high incidence in carcinoma of the kidney (Bullock and Hirst, 1953; Glomset, 1938; Abrams *et alii*, 1950). The low incidence of adrenal metastases in malignant neoplasms of the gastro-intestinal and urogenital tracts also accords with the findings of other writers (Bulloch and Hirst, 1953; Glomset, 1938; Willis, 1952), although Abrams *et alii* (1950) report a high incidence (21%) in carcinoma of the stomach. The high incidence in carcinoma of the thyroid has not been previously noted, possibly because of the relative rarity of this tumour. However, in view of the small number of cases of carcinoma of the thyroid in the present series, some caution should be exercised in accepting the figure of 22% as a true indication of the incidence of adrenal metastases in this disease.

The site of the metastases within the gland duplicates the findings of other writers (Bullock and Hirst, 1953; Willis, 1952). The low incidence of metastases in the cortex would appear to provide evidence against the hypothesis that some types of primary tumour, for example, carcinoma of the lung, metastasize to the brain and adrenals because of the high lipoid context of these organs. On this hypothesis a high incidence of metastases would be expected in the lipoid-rich cortical cells, with a low incidence in the medulla. The vascular distribution within the gland may offer a mechanical explanation for the frequency of medullary metastases in that there is a relatively slow blood flow in the medullary sinusoids. However, tumour emboli are more likely to be arrested in the capillaries running through the cortex from the capsule to medullary sinusoids, and this would favour cortical metastases. In certain types of malignant disease, such as carcinoma of the breast and prostate, hormones produced in the cortical cells might influence the occurrence and site of metastases in the gland.

No obvious explanation can be advanced to account for the frequency of left-sided adrenal metastases in carcinoma of the stomach. Except those about the large veins, lymphatic capillaries have not been demonstrated in the substance of the gland (Maximow and Bloom, 1957), and there is no apparent direct vascular connexion between the stomach and the left adrenal gland (Gray, 1954). Further statistics are obviously needed to confirm this finding.

The lower age incidence of cases of adrenal metastases, as compared with all cases of a particular type of neoplasm, possibly reflects a tendency to enhanced malignant disease and a consequent increase in all metastases in neoplasms occurring in younger patients.

Summary.

Two hundred and seventy-five cases of metastatic tumour in the adrenal glands are reported from a series of 3012 autopsies on patients with malignant neoplasms. Adrenal metastases occur most commonly in melanoma, in carcinoma of the lung, breast and kidney, and probably in carcinoma of the thyroid. They are not influenced by sex, but are more frequent in young patients, and are slightly more numerous in the left gland than in the right. The initial lesion occurs in the medulla in a large proportion of cases. A discussion of some of the findings is appended.

Acknowledgement.

I should like to thank Dr. J. D. Hicks, pathologist to the Royal Melbourne Hospital, for advice and encouragement in the preparation of this report.

References.

ABRAMS, H. L., SPIRO, R., and GOLDSTEIN, N. (1950), "Metastases in Carcinoma; Analysis of 1000 Autopsied Cases", *Cancer*, 3: 74.

BULLOCK, W. K., and HIRST, A. E. (1953), "Metastatic Carcinoma of the Adrenal", *Amer. J. med. Sci.*, 226: 521.

EDWARDS, A. S., and HOLLAND, J. F. (1954), "Metastatic Carcinoma to the Adrenal Glands with Cortical Hypofunction", *Cancer*, 7: 1242.

GLOMSET, D. A. (1938), "The Incidence of Metastasis of Malignant Tumours to the Adrenals", *Amer. J. Cancer*, 32: 57.

GRAY'S ANATOMY, DESCRIPTIVE AND APPLIED (1954), edited by T. B. Johnston and J. Whillis, Longmans, Green and Co., London: 861.

MAXIMOW, A. A., and BLOOM, W. (1957), "Textbook of Histology", Saunders, Philadelphia: 317.

WILLIS, R. A. (1952), "The Spread of Tumours in the Human Body", Butterworth, London: 199.

GLUCOSE TOLERANCE IN METABOLIC ACIDOSIS: I. NON-DIABETIC SUBJECTS.

By C. W. BAIRD, [1,2]

From the Department of the James Stewart Professor of Medicine, University of Melbourne, and the Royal Melbourne Hospital.

THE influence of metabolic acidosis of non-diabetic origin on carbohydrate metabolism has not been studied extensively. Linder *et alii* (1924) showed that glucose tolerance was diminished in acute nephritis, and considered that the acidosis might have been responsible. However, these results are difficult to interpret, because of an inadequate dietary intake of carbohydrate prior to testing and the limitations of the technique for estimating blood glucose content. Mackler *et alii* (1951, 1953) induced severe metabolic acidosis in dogs. They found that such animals had a decreased glucose tolerance and a decreased sensitivity to insulin. In addition, there was a decreased glucose uptake by extrahepatic tissues and a decreased rate of glycolysis in blood cells (Mackler *et alii*, 1952; Granboth *et alii*, 1953).

Guest (1949) and Hudson and Martin (1958) believe that in patients with diabetic ketosis, early correction of the acidosis aids recovery and is an important therapeutic measure. Additional objective evidence is needed to establish the rationale of this method of treatment.

The current investigation forms the first of a series of experiments designed to study carbohydrate metabolism in metabolic acidosis. It concerns the effect of acidosis

[1] Present address: Radcliffe Infirmary, Oxford, England.

[2] Aided by Elizabeth Ross Scholarship, University of Melbourne.

per se on carbohydrate metabolism in normal subjects. The degree of acidosis was assessed by blood pH measurements, and carbohydrate metabolism was studied with the use of a modified intravenous glucose tolerance test.

Material and Methods.

The subjects studied were all volunteers, either healthy medical personnel or convalescent non-diabetic patients. The ages and relevant clinical details are set out in Table I. All the subjects took more than 200 grammes of carbohydrate for the three days preceding the test, but were fasted for 15 to 18 hours prior to the test, except that patients who were receiving drugs to produce acidosis were given their 12 midnight and 6 a.m. dose of the appropriate drug with a little water on the night before the experiment, the last dose being given three hours before the test began. Two or more tests were performed on each subject, who thus acted as his own control. A total of 44 tests was done on 21 subjects.

The intravenous glucose tolerance test was a modification of those tests used by other workers (Amutzio *et alii*, 1953; Duncan, 1956a). To ensure basal conditions (Fraser and Nordin, 1955), 100 mg. of sodium quinalbarbitone were given orally with a little water 30 minutes before the start of the test. The subject then rested quietly in a warm room. After 30 minutes had elapsed, an indwelling needle was inserted under local anæsthesia into a vein in one forearm, and a polyethylene catheter was threaded up an ante-cubital vein of the opposite arm. Starting 15 minutes later, two or three samples of blood were taken at intervals of two to four minutes for analysis of the fasting blood glucose content. Samples were taken with a minimum of venostasis; the stylet was withdrawn, and three to five drops of blood were allowed to escape before the blood was collected for analysis in the well of a blood-grouping tile. Three minutes later 50 ml. of a 50% solution of glucose, containing 12,500 units of heparin, were injected through the catheter, the injection being completed in less than two minutes. Timing began at the end of the glucose injection, and samples were then taken every four minutes for the next 36 minutes by the technique described above. Blood for glucose analysis (0·1 ml.) was taken from the wells of the blood-grouping tile immediately after sampling, with a Lang-Levy micropipette. All analyses were done in duplicate by the Nelson (1944) photometric method, with the use of the copper reagent of Somogyi (1952). The total index of glucose tolerance, *K*, of Bastinie (1953) was calculated from the equation given by Duncan (1956a), on results from the period 12 to 32 minutes.

Blood for pH determination was withdrawn anaerobically into a syringe moistened with heparin immediately prior to injection of the glucose solution. Determinations were usually done at once, but where this was not possible, the samples were refrigerated immediately. All determinations were completed within two hours of the samples being taken, and were carried out in an Astrup apparatus at 38° C. (Astrup and Schroder, 1956). Each value for blood pH given in Table I is the mean of three determinations.

The interval between repetition of the tests varied in each patient, the limits being from four days to three months. In most, the interval was seven to 10 days.

Two patients developed local venous thrombosis accompained by mild pyrexia and some pain at the injection site. Occasionally during the injection of the glucose, patients complained of a transient hot flush.

Production of Acidosis.

Group I: Controls. The control group did not receive tablets to produce acidosis on any occasion. This procedure was adopted in order to ensure that neither *K* nor the pH was affected by repetition of the test.

Group II: Patients receiving acetazolamide. The six patients who received this drug were given 0·25 gramme every six hours for four doses.

Group III: Patients receiving ammonium chloride. (a) Three subjects were given ammonium chloride, two grammes every six hours for three doses; (*b*) three subjects were given ammonium chloride, two grammes every six hours for four doses; (c) four subjects were given ammonium chloride, two grammes every six hours for 16 doses.

On the foregoing regimes no patient complained of any reaction to the drug.

Results.

The results of all tests are summarized in Table II.

There was no significant variation in either the *K* values or the blood pH in the control group on repeated determinations.

The results obtained from the subjects given acetazolamide show that there was a significant lowering of blood pH after administration of the drug, but there was no significant variation in *K*. The administration of ammonium chloride in a dosage of 2 grammes every six hours for three doses did not produce a significant acidosis (subjects 13, 14, 15), but if given for longer than this, a significant lowering of blood pH was obtained. Analysis of the *K* values, with or without including subjects 13, 14 and 15, showed no significant variation whether or not acidosis was produced.

Discussion.

Astrup and Schroder (1958) showed that much of the earlier work on the measurement of blood pH carried out below 37° C. is of doubtful value. They found that temperature correction factors calculated by different workers varied quite appreciably from one blood sample to another (Graig *et alii*, 1952; Rosenthal, 1948). They recommended that all blood pH measurements should be carried out anaerobically and at a constant temperature of 38° C. They also stated that the pH of blood stored anaerobically at 0° C. did not change over several hours. Astrup's methods were closely followed in the present study.

The intravenous glucose tolerance test has been shown by many workers to be a reproducible index of carbohydrate metabolism in a given individual (Duncan, 1956a; Amutzio *et alii*, 1953). It is therefore a very suitable method for studying variations of carbohydrate metabolism in an investigation in which the subject can serve as his own control.

The total index of glucose tolerance (*K*) was chosen in preference to the increment index of Amutzio *et alii* (1953), because the recent investigation of Ikkos and Luft (1958) suggests that the total index is more precise. The fasting blood glucose values are included in the details of results, to permit calculation of the increment index.

The technique adopted for the intravenous glucose tolerance test merits discussion. The short-acting barbiturate was given to allay nervousness, and hence to decrease fluctuation in the blood glucose content due to this cause. The subjects remained calm and at rest throughout the tests, and more than 50% of patients dozed during their performance. The use of an indwelling venous needle, especially if inserted under local anæsthesia, was preferred to finger pricks by patients and made the collection of blood samples a simple matter (Rosenthal *et alii*, 1950; Hinkle *et alii*, 1952). Emotional stimuli, which may lead to changes in the blood glucose level (Mirsky, 1946), are thus reduced. The use of a blood-grouping tile to aid in the collection and accurate sampling of venous blood has previously been used by the author (Baird, 1958) with satisfactory results.

The results given in this paper show that significant metabolic acidosis produced in normal subjects led to no detectable variation in glucose tolerance. Two important factors will be considered in relation to these results, namely, the degree of acidosis and the normal carbohydrate metabolism of the subjects.

The degree of acidosis produced was mild and in conformity with the results of other workers who have used ammonium chloride to induce acidosis in human subjects. Wood (1955) used a similar dose of the drug (8 grammes per day), and was unable to lower the blood pH below 7·28. It appears that this method will not produce an acidosis of comparable severity to

TABLE I.

Clinical Data and Details of Results of Intravenous Glucose Tolerance Tests.

Subject.	Age. (Years.)	Sex.	Clinical Condition.	Type of Test.[1]	FBS.[2]	pH.	Minutes after Glucose Injection. 4	8	12	16	20	24	28	32	36	K.[3]
1	36	M.	Buerger's disease ..	C_1	80	7·32	185	201	188	172	151	140	134	125	121	1·90
				C_2	80	7·30	256	214	203	183	171	153	145	139	136	2·04
2	34	M.	Healthy	C_1	80	7·41	252	227	209	193	179	164	161	157	153	1·43
				C_2	85	7·40	257	228	199	184	170	163	154	150	146	1·41
3	30	M.	Acute nephritis	C_1	52	7·37	—	206	189	186	168	158	148	138	124	1·52
				C_2	66	7·36	—	218	192	170	164	152	145	136	129	1·61
4	57	F.	Pernicious anæmia ..	C_1	56[4]	7·35	193	182	174	160	148	138	131	124	122	1·62
				C_2	60	7·37	319	277	268	239	231	216	209	193	187	1·70
5	69	M.	Hypertension	C_1	75	7·33	264	195	189	189	178	170	164	159	153	0·87
				C_2	65	7·35	288	225	193	188	180	184	172	168	158	0·70
6	29	M.	Healthy	C_1	66	7·39	253	232	217	212	206	201	194	189	182	0·69
				C_2	78	7·40	259	228	218	210	204	200	192	186	182	0·79
7	32	M.	Healthy	C	60	7·38	274	249	227	213	200	173	165	142	130	2·35
				A_1	62	7·15	321	268	247	227	201	178	160	145	—	2·66
8	29	M.	Pleural effusion	C	75	7·37	267	230	217	212	206	200	185	181	175	0·91
				A_2	68	7·18	281	251	240	232	216	216	200	195	185	1·03
9	67	M.	Cerebral vascular accident	C	73	7·40	182	211	174	174	169	163	158	144	140	0·95
				A_1	63	7·31	208	185	181	173	163	158	155	148	140	1·01
10	36	M.	Hypertension	C	81	7·42	246	234	219	212	203	188	173	166	159	1·38
				A_1	75	7·30	294	267	246	231	218	201	197	184	172	1·45
11	55	M.	Pulmonary tuberculosis ..	C	77	7·43	326	267	260	—	240	229	—	202	187	1·37
				A_1	83	7·30	375	331	288	281	257	246	240	234	214	1·24
12	67	M.	Emphysema	C	69	7·33	226	239	216	209	204	201	193	193	189	0·56
				A_1	69	7·19	170	225	219	211	205	200	197	197	191	0·52
13	51	M.	Hypertension	C	77	7·42	251	234	219	213	205	200	195	191	184	0·64
				N_6	74	7·40	257	230	218	211	205	201	193	190	188	0·69
14	59	M.	Gastric ulcer	C	54	7·31	232	217	200	189	181	178	170	160	162	1·12
				N_6	51	7·31	299	268	238	222	214	206	201	190	190	1·13
15	52	M.	Cerebral vascular accident	C	73	7·30	219	228	219	206	197	188	186	177	172	1·06
				N_6	70	7·285	214	219	204	191	191	177	172	164	161	1·09
16	36	M.	Buerger's disease ..	C	80	7·32	185	201	188	172	151	140	134	125	121	1·93
				N_6	81	7·17	196	203	189	176	154	150	140	132	122	1·79
17	44	M.	Chronic empyema.. ..	C	84	7·45	274	238	227	218	211	206	196	185	179	1·02
				N_6	76	7·29	253	212	207	197	189	182	176	170	160	0·99
18	36	M.	Hypertension	C	81	7·42	246	234	219	212	203	188	173	166	159	1·38
				N_6	82	7·29	265	241	229	215	205	194	181	179	170	1·23
19	44	M.	Hypertension	C	84	7·45	311	288	247	239	223	218	215	206	200	0·91
				N_{32}	81	7·32	—	270	254	236	230	221	207	195	190	1·08
20	51	M.	Cerebral vascular accident	C	93	7·40	267	250	231	217	207	200	196	194	191	0·90
				N_{32}	71	7·33	277	240	230	220	205	200	193	189	186	0·96
21	32	M.	Myocardial fibrosis ..	C	67	7·42	316	251	234	214	200	194	182	178	170	1·37
				N_{32}	65	7·32	280	240	223	207	192	187	173	169	161	1·38
22	29	M.	Peptic ulcer	C	75	7·395	232	224	209	186	167	155	139	125	113	2·56
				N^{32}	75	7·29	236	227	207	189	169	144	130	124	108	2·52

[1] C, C_1, C_2 = control tests; A_1 = tests with acetazolamide, one gramme; N_6 = tests with ammonium chloride, six grammes; N_8 = tests with ammonium chloride, eight grammes; N_{32} = tests with ammonium chloride, 32 grammes.

[2] *FBS = fasting blood sugar level (mg. per 100 ml.).*

[3] *K* = total index of glucose tolerance.

[4] Only 30 grammes of glucose were injected.

diabetic acidosis. The same is true for the acidosis *due to acetazolamide.*

A normal subject has considerable ability to adjust his carbohydrate metabolism to cope with factors which are known to diminish glucose tolerance. *Cortisone, for* example, has diabetogenic properties when given in *sufficiently large and prolonged dosage to animals and* man. After a single dose of cortisone, no alteration of glucose tolerance is observed in normal subjects (Duncan, *1956b), and it is assumed that normal subjects have* sufficient metabolic reserve to overcome this effect on their glucose tolerance. If acidosis leads to decreased glucose tolerance, *it seems probable that the failure to* demonstrate this in normal subjects is because they are *similarly able to adjust their carbohydrate metabolism.* Evidence from recent in-vitro experiments by Rogers (1958) supports this view. This worker incubated rat diaphragms in a glucose-containing medium buffered in the range pH 6·8 to 7·4. *Glucose uptake of the muscle* was not influenced by pH change, provided sufficient *insulin was present. If only small amounts of insulin* were added to the buffer, glucose uptake fell as the pH was lowered.

Summary.

The effect of induced metabolic acidosis on carbohydrate *metabolism in non-diabetic humans was studied.* Carbohydrate metabolism was assessed by a modified *intravenous glucose tolerance test.* The degree of acidosis was determined by measuring the pH of blood at *38° C.*

No alteration in carbohydrate metabolism was found after the *induction of a mild, but significant, acidosis.*

TABLE II.

Changes in pH and in Total Glucose Index, K, in Metabolic Acidosis.

Group.	Number of Pairs.	K±SEM.[1]	ΔK.	P.	Blood pH ±SEM.	ΔpH.	P.
I. Control: First test .. .. / Second test	6	1·34±0·18 1·38±0·22	+0·04	—	7·36±0·014 7·36±0·018	0·00	—
II. Before acetazolamide .. / After acetazolamide ..	6	1·26±0·25 1·32±0·30	+0·06	>0·8	7·39±0·015 7·24±0·030	−0·15	<0·01
III. (a) Before ammonium chloride / After ammonium chloride, six grammes.	3	0·94±0·25 0·97±0·14	+0·03	>0·9	7·34±0·038 7·33±0·034	−0·01	>0·9
(b) Before ammonium chloride / After ammonium chloride, eight grammes.	3	1·44±0·20 1·34±0·24	−0·10	>0·10	7·40±0·040 7·25±0·040	−0·15	<0·01
(c) Before ammonium chloride / After ammonium chloride, 32 grammes.	4	1·44±0·23 1·48±0·16	+0·04	>0·80	7·42±0·037 7·32±0·030	−0·10	<0·01
Total Group III: Before ammonium chloride / After ammonium chloride	10	1·29±0·18 1·29±0·16	0·00	—	7·40±0·018 7·30±0·018	−0·10	<0·01

[1] *SEM*=standard error of the mean.

It is considered that non-diabetic subjects can adjust their carbohydrate metabolism to compensate for the acidosis.

Acknowledgements.

Miss M. Bick, Biochemist at the Alfred Hospital, Melbourne, carried out many of the blood pH determinations. Mr. P. H. Drost gave valuable technical assistance. The writer is grateful to Professor R. R. H. Lovell and to Dr. H. P. Taft for criticism and encouragement.

References.

AMUTZIO, D. S., STATZMAN, F. L., VANDERBILDT, M. J., and NESBIT, H. S. (1953), "Interpretation of the Rapid Intravenous Glucose Tolerance Test in Normal Individuals and in Mild Diabetes Mellitus", *J. clin. Invest.*, 32: 428.

ASTRUP, P., and SCHRODER, S. (1956), "Apparatus for Anaerobic Determination of pH of Blood at 38 Degrees Centigrade", *Scand. J. clin. lab. Invest.*, 8: 30.

BAIRD, C. W. (1958), Ph.D. Thesis, University of Melbourne.

CONRAD, V., FRANKSON, J. R., BASTINIE, P. A., KESTANS, J., and KOVAKS, L. (1953), "*Étude critique du triangle d'hyperglycemie intraveineux chez l'homme normal et détermination d'un coefficient d'assimilation glucidique*", *Arch. int. Pharmacodyn.*, 93: 277.

BICK, M. (1958), personal communication.

DUNCAN, L. J. P. (1956*a*), "The Intravenous Glucose Tolerance Test", *Quart. J. exp. Physiol.*, 41: 85.

DUNCAN, L. J. P. (1956*b*), "Cortisone-Induced Impairment of Glucose Tolerance in the Detection of the Diabetic Diathesis", *Quart. J. exp. Physiol.*, 41: 453.

FRASER, R., and NORDIN, B. E. C. (1955), "The Basal Metabolic Rate During Sleep", *Lancet*, 1: 532.

GRAIG, F. A., LANGE, K., OBERMAN, J., and CARSON, S. (1952), "A Simple Accurate Method of Blood pH Determinations for Clinical Use", *Arch. Biochem.*, 38: 357.

GRAUBARTH, H., MACKLER, B., and GUEST, G. M. (1953), "Effect of Acidosis on Utilization of Glucose in Erythrocytes and Leucocytes", *Amer. J. Physiol.*, 172: 301.

GUEST, G. M. (1949), "Diabetic Coma", *Amer. J. Med.*, 7: 630.

HINKLE, L. E. and WOLF, S. (1952), "The Effects of Stressful Life Situations on the Concentration of Blood Glucose in Diabetic and Non-Diabetic Humans", *Diabetes*, 1: 383.

HUDSON, B., and MARTIN, F. I. R. (1958), personal communication.

IKKOS, D., and LUFT, R. (1957), "On the Intravenous Glucose Tolerance Test", *Acta endocr.* (*Kbh.*), 25: 312.

LINDER, G. C., HILLER, A., and VAN SLYKE, D. D. (1924), "Carbohydrate Metabolism in Nephritis", *J. clin. Invest.*, 1: 247.

MACKLER, B., LICHTENSTEIN, H., and GUEST, G. M. (1951), "Effects of Ammonium Chloride Acidosis on the Action of Insulin in Dogs", *Amer. J. Physiol.*, 166: 191.

MACKLER, B., LICHTENSTEIN, H., and GUEST, G. M. (1953), "Effects of Ammonium Chloride Acidosis on Glucose Tolerance in Dogs", *Amer. J. Physiol.*, 168: 126.

MACKLER, B., MITHOFER, J., GRAUBARTH, H., AMMENHORF, P., and GUEST, G. M. (1952), "Glucose Utilization in Acidotic Hepatectomized Dogs and Eviscerated Dogs", *Amer. J. Physiol.*, 169: 561.

MIRSKY, I. A. (1946), "Emotional Hyperglycæmia", *Proc. Central Soc. Clin. Res.*, 19: 74.

MOSENTHAL, H. O., and BARRY, E. (1950), "Criteria for and Interpretation of Normal Glucose Tolerance Tests", *Ann. intern. Med.*, 33: 1175.

NELSON, N. (1944), "A Photometric Adaption of the Somogyi Method for the Determination of Glucose", *J. Biol. Chem.*, 153: 375.

ROGERS, T. A. (1958), "Inhibition of Glucose Uptake by Acidosis *in Vitro*", *Proc. Soc. exp. Biol.* (*N.Y.*), 97: 647.

ROSENTHAL, T. B. (1948), "The Effect of Temperature on the pH of Blood and Plasma *in Vitro*", *J. biol. Chem.*, 173: 25.

SOMOGYI, M. (1952), "Notes on Sugar Determination", *J. Biol. Chem.*, 195: 19.

WOOD, F. J. Y. (1955), "Ammonium Chloride Acidosis", *Clin. Sci.*, 14: 81.

RECURRENT SUBLUXATION OF THE ANKLE JOINT.

By F. V. STONHAM,

Melbourne.

RECURRENT SUBLUXATION of the ankle joint is by no means an uncommon condition and it follows an unhealed rupture of the lateral collateral ligament of the ankle joint. It occurs in soldiers, athletes, farmers and others whose occupations lead them to walk over rough ground, and render them liable to inversion injury. The symptoms vary considerably in frequency and severity. Typically, the patient, while walking, suddenly goes over on his ankle and experiences severe or even excruciating pain, which may be momentary or may take several days to settle down and may be accompanied by swelling and tenderness over the lateral aspect of the ankle. In some persons the giving way may occur only a few times in the course of a year, while in others it may be of almost daily occurrence, and they may feel no confidence in the stability of the ankle and are afraid to walk on uneven surfaces or in places where a fall would expose them to danger. Badly-worn shoes usually aggravate the tendency to subluxation. The patients learn to walk cautiously and the condition may interfere with both choice of occupation and recreation.

Diagnosis.

The ankle may be normal in appearance, but inversion is abnormally free and may exceed that of the contralateral foot. Extreme inversion may be very painful, and if the ankle has recently been painful from subluxation, inversion may be so painful that it is resisted by involuntary muscle contraction. Usually, on palpation over the front of the ankle joint, the talus may be felt to tilt on inversion and it may move forwards. X-ray examination demonstrates the inward rotation of the talus on forced inversion and may reveal avulsion of the tip of the lateral malleolus. Sometimes there is injury

of the medial malleolus. If the ankle is very painful, *it may be necessary to use an anæsthetic to obtain* sufficient inversion to demonstrate the tilting of the talus.

The condition occurs mainly in males, and it is important to distinguish it from instability of the ankle without subluxation of the talus, which occurs more *commonly in women. The cause of this is obscure;* it is probably due to abnormal mobility of the ankle joint and to muscular insufficiency. High or worn heels *may precipitate giving way, which causes recurrent* sprain of the lateral collateral ligament. The symptoms are usually not severe.

Treatment.

Prophylaxis.

In all inversion injuries other than trivial, the possibility of injury of the lateral collateral ligament should be suspected, and the ankle should be examined for undue mobility of the talus and radiologically investigated. *Pain and induration of the tissues may make it necessary* to use an anæsthetic to obtain a radiological diagnosis. The foot should be immobilized in plaster in neutral position for two weeks and then examined, and the immobilization continued as long as there are marked pain and tenderness.

In any case, even if the lateral collateral ligament is not ruptured, two weeks' immobilization in plaster is by far the most efficient treatment for a severe sprain.

Non-Operative Measures.

If the symptoms are not very frequent or severe, the instability may be controlled by the patient being fitted with boots with the heel splayed or "floated" laterally and strongly reinforced with nails to limit wear. It is neither necessary nor desirable to raise the lateral aspect of the heel. If the instability can be controlled only by the use of an iron, the patient is better served by an operation. Physiotherapy, manipulation, and exercises with the object of strengthening the peroneal muscles are futile.

Operative Measures.

Operative measures are called for when the instability of the ankle cannot be controlled by simple means or when the occupation is such that a fall would expose the patient to danger, for instance, building construction. A six-inch incision is made parallel with the peroneus brevis tendon 1 cm. behind it, and the skin and subcutaneous tissues anterior to it are reflected forward, to expose the lower end of the fibula (Figure I). The

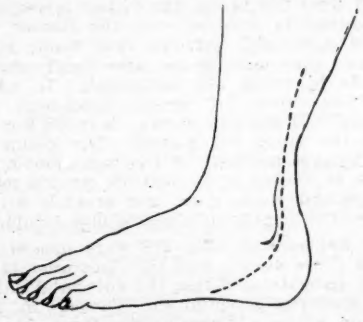

FIGURE I.
The incision.

deep fascia and peroneal retinaculum are incised and the peroneus brevis tendon is stripped from the muscle and cut about three or four inches above the lower extremity of the fibula. A drill hole of appropriate size is made in the lateral malleolus from behind forwards and downwards, and the tendon is passed through it and pulled taut and sutured to the distal portion of the tendon (Figure II). The area in the muscle from which it was cut is then sutured to the peroneus longus and the wound is closed.

A plaster cast is applied for three weeks, and walking is then commenced after a few days' non-weight-bearing exercises. Stiffness and swelling rapidly disappear.

The simple tenodesis described has been perfectly satisfactory. The operation is simple and rapid and *completely controls the instability. The condition does not* recur and the patient can usually resume his occupation shortly after removal of the plaster.

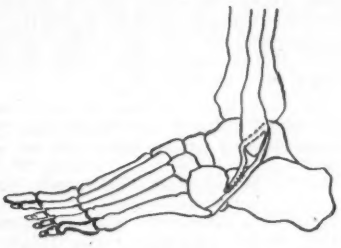

FIGURE II.
Diagram showing obliquity of the hole through the lateral malleolus to prevent the distal end of the tendon being pulled forwards.

I described this operation in a paper read at the Australian Orthopædic Association annual meeting in Sydney in August, 1955. A closely similar operation has been described by H. G. Lee (1957).

Reference.

LEE, H. G. (1957), "Surgical Repair in Recurrent Dislocation of the Ankle Joint", *J. Bone J. Surg.*, 39A: 828.

THE HAPTOGLOBIN GROUPS OF WHITE AUSTRALIANS.

BY R. L. KIRK, LAWRENCE LAI AND D. L. HOGBEN,
Zoology Department, University of Western Australia, Perth.

SMITHIES, using a technique of zone electrophoresis in starch gel, has shown that human serum can be classified into three distinct groups (Smithies 1955 *a* and *b*). This discovery, and the subsequent demonstration that these groups are inherited as though controlled by a pair of allelic genes (Smithies and Walker, 1955), has opened up an entirely new field, not only in the study of serum proteins, but also in human genetics. The differences between the serum protein patterns obtained by electrophoresis in starch gel of serum from persons belonging to the three groups are due to variations in the hæmoglobin-binding proteins known as haptoglobins, originally discovered by Jayle (1939). In consequence, Smithies has suggested that the term haptoglobin groups be used to refer to these characteristic patterns, and he has suggested also that the genes controlling these groups be referred to as Hp^1 and Hp^2 (Smithies and Walker, 1956). According to Smithies' notation, the following groups and genotypes can be distinguished in the population:

Haptoglobin group:	1-1	2-1	2-2
Genotype:	Hp^1 Hp^1	Hp^1 Hp^2	Hp^2 Hp^2

Since the differences between the groups depend on variations in the haptoglobin proteins, the hæmoglobin-binding property of these proteins can be used to visualize more readily the difference between the electrophoretic pattern of serum from persons belonging to the three haptoglobin groups. A small quantity of oxyhæmoglobin

is added to the serum to be tested before electrophoresis, and the position of the haptoglobin-hæmoglobin complexes is determined by treating the electrophoretic strip with a benzidine or o-tolidine reagent. More recently Owen, Silberman and Got (1958) have developed a peroxidase technique, which enables a more permanent staining of the hæmoglobin complexes to be obtained.

When free hæmoglobin is added to the serum, differences in the mobility of the haptoglobin-hæmoglobin complexes in sera belonging to the different groups can be detected also after electrophoresis on filter paper (Poulik and Smithies, 1958; Budtz-Olsen, 1958), and a similar difference can be noted after electrophoresis in starch blocks (Bearn and Franklin, 1958). However, Poulik and Smithies give the warning that in many cases in which the total amount of haptoglobin present in the serum is low, accurate determination of the haptoglobin group after filter-paper electrophoresis may be difficult.

During the last three years, intensive studies by a number of workers have confirmed and extended the original investigations of Smithies and his collaborators. Galatius-Jensen (1957) has shown that the haptoglobins of new-born infants are poorly developed. However, even in adults some individuals have no detectable haptoglobins present, and these have to be classified in a fourth group designated 0–0 (Allison *et alii*, 1958). It has been suggested that the absence of haptoglobins in some adults may follow excessive hæmolysis or hæmolytic disease (Laurell and Nyman, 1957; Aber, Neale and Northam, 1957; Allison and ap Rees, 1957), or that it may be due in other cases to a gene (or genes) allelic with or modifying the haptoglobin genes (Galatius-Jensen, 1957; Harris *et alii*, 1958).

The use of genetic markers in anthropological studies has become a major activity during the last twenty years. The haptoglobin groups readily lend themselves to such studies. Sutton, Neel, Binson and Zuelzer (1956) found a significant difference in haptoglobin group frequency between whites and American Negroes, and Allison, Blumberg and ap Rees (1957) showed differences between British persons and Nigerians. In the latter group, the distribution was characterized by a very high frequency of individuals without haptoglobins (group 0–0). Budtz-Olsen (1958) has reported recently a preliminary survey of haptoglobin groups in Australian aborigines, using the technique of electrophoresis on filter paper.

In order to increase our knowledge of the haptoglobin group frequency of peoples in South-East Asia and in the Pacific area, we have used the technique of starch gel electrophoresis, and hope that it may be possible to establish here a reference laboratory for work of this kind. So far we have classified the sera of nearly 400 white Australians, 323 of them representing a single unselected sample of healthy adults. In addition, sera from several places in South-East Asia have been classified and will be reported on in due course when the investigation in each of the areas is complete.

Techniques.

The various procedures used are as follows.

Whole blood is collected from a convenient arm vein into a sterile tube, allowed to clot and left overnight at 4° C. The serum is then separated and centrifuged at 3000 r.p.m. for 10 minutes, and the clear supernatant is transferred to screw-cap bottles and stored at −15° C. Before use, 0·05 ml. of a 0·6% solution of oxy-hæmoglobin is added to 0·25 ml. of each serum to give a final concentration of 100 mg. of hæmoglobin per 100 ml. of serum.

The sample is applied as 0·015 ml. of the serum-hæmoglobin mixture to a filter-paper strip 7 by 5 mm. in area (Whatman No. 3), and the strips are inserted into slots cut in the starch gel.

Gels are prepared from hydrolysed starch according to the method of Smithies (1955*b*). Of the starches tried so far, that employed by Smithies and prepared by hydrolysing Idaho potato starch is by far the most satisfactory (the hydrolysed starch is supplied by the Connaught Medical Research Laboratories, Toronto, and is standardized before dispatch). The hot starch solution is poured into "Perspex" trays 27·0 by 2·0 by 0·7 cm. in volume, and covered with a strip of "Perspex" 0·3 cm. thick to exclude all air bubbles. Trays are prepared in the afternoon and used the next morning.

Slots are cut 10 cm. and 17 cm. from one end of the tray, a knife mounted on a vertical rack being used for this purpose. Two strips are inserted in each slot, a known group 2-1 serum being placed alongside each unknown as standard. Normally 10 such trays are run together, so that 20 unknown samples can be determined at a time. The trays are supported on a flat aluminium sheet between the double compartment electrode vessels. Electrical connexion between the borate buffer in the electrode vessel and the starch gel is made with thick filter-paper wicks, and each gel is covered with a thin sheet of polythene 20 cm. long. Another sheet of polythene is placed over all the trays and covered with damp linen to reduce the gel temperature.

Silver-silver chloride electrodes dip into 10% sodium chloride solution in the outermost compartment of the electrode vessels. This is connected with the borate buffer in the inner compartment by a thick layer of filter paper running the full width of the vessel. The electrophoretic conditions are 10 volts per cm. for four and a half hours: the pH of the starch gel is 8·4.

At the end of electrophoresis, the gels are removed from the trays and sliced along their length with a dermatome knife into two halves each 0·35 cm. thick. One half is treated with benzidine reagent (one volume of saturated benzidine solution in 95% alcohol, one volume of 3% hydrogen peroxide, the whole acidified with glacial acetic acid to dissolve the precipitate). The other half is retained for standing with naphthalene black if examination of the other protein components in the serum is required. The benzidine stained gels are examined five minutes later and the results recorded. Each gel is examined by two independent observers, and the results are checked to avoid clerical errors. When any doubt exists on the interpretation of a pattern, a repeat sample is run on the following day.

The Haptoglobin Groups of White Australians.

The haptoglobin groups have been determined in a series of 394 white Australians. Figure I reproduces the typical patterns obtained when the starch gels are stained with benzidine to reveal the haptoglobin-hæmoglobin complexes. Considerable variation in intensity of the bands occurs, but the relative position of the bands is always clear-cut. In group 1–1 individuals, either a single or double band may be present (Allison and ap Rees, 1957). If the haptoglobin is present in maximum concentration, two bands can be seen when 100 mg. of hæmoglobin per 100 ml. of serum are added. If lower concentrations of haptoglobin are present in a group 1–1 person, then only one band appears under these conditions.

In group 2–1 persons, the pattern obtained normally reveals at least five bands, the fastest migrating of these being identical in position with the slowest of the 1–1 bands. In group 2–2 persons, four bands can be seen readily, and they all migrate more slowly than the first four bands in group 2–1 individuals. In addition, the pattern from group 2–2 persons frequently shows free hæmoglobin in a position midway between the two fastest bands in the group 2–1 pattern. The group 0–0 serum reveals the presence only of free hæmoglobin. At a concentration of 100 mg. of hæmoglobin per 100 ml. of serum, free hæmoglobin reacts much less intensely with benzidine than does the haptoglobin-hæmoglobin complex.

Of the 394 sera studied, 323 were unselected samples from Red Cross donors, and the remaining 71 were from maternity patients attending the ante-natal clinic at King Edward Memorial Hospital for Women. In Table I the haptoglobin group distribution for these two samples is given, together with the available figures for other Caucasian white samples.

Our own series is very similar to the large sample of Danes analysed by Galatius-Jensen (1958). No significant differences exist between any of the samples. A direct comparison between that of Allison *et alii* (1958) and our own Red Cross series, in which the largest discrepancies exist, gives χ^2 a value of 4·5 with two degrees of freedom ($0{\cdot}2 > P > 0{\cdot}1$) if the 0–0 individuals are omitted.

Sex and Age Distribution.

Table II gives the sex and age distribution of the 323 Red Cross donors in our own series. The sex distributions are almost identical ($\chi^2 = 1{\cdot}04$ with two degrees of freedom; $0{\cdot}7 > P > 0{\cdot}5$). Similarly, although there is a greater proportion of group 2–2 individuals aged under 30 years, there is no significant heterogeneity in the sample as a whole. A direct comparison of those aged under 30 years with those aged 30 years and over gives $\chi^2 = $ a value of 3·52 with two degrees of freedom ($0{\cdot}2 > P > 0{\cdot}1$).

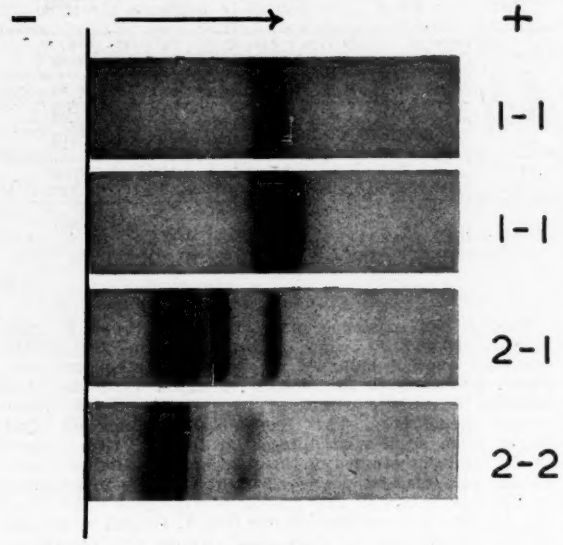

FIGURE I.

Starch gel electrophoretic patterns of human haptoglobin groups. The haptoglobin-hæmoglobin complexes are stained with benzidine.

Haptoglobin Gene Frequencies.

Since the heterozygotes can be distinguished, the gene frequencies of the two haptoglobin alleles can be determined by a direct count of the genes in a manner similar to that for the MN blood groups (Stevens 1938). With the use of the data from the 322 Red Cross donors (excluding the singe 0–0 individual), the frequency of Hp^1 is 0·3773 and of Hp^2 0·6227. When these frequencies are used to calculate the expected values (Table III), the validity of the simple allelic hypothesis can be tested by calculating χ^2 for the distribution with one degree of freedom. For the present series, comparison of the observed number in the three haptoglobin groups with those expected if a pair of allelic genes are controlling the groups shows the two to be almost identical ($\chi^2_{(1)} = 0{\cdot}07 : 0{\cdot}8 > P > 0{\cdot}7$).

Discussion.

The analysis of the results obtained in the Perth sample shows that in our hands the method of starch gel electrophoresis enables a clear-cut and reliable determination of haptoglobin group to be made. We have paid attention particularly to the occurrence of group 0–0 individuals, since considerable uncertainty still exists on the precise genetic or other control of this group. Of 323 sera tested from Red Cross donors, only one (from a male, aged 36 years) was found to contain no haptoglobins. Allison *et alii* (1958), in a comparable English sample, found six samples in 218 persons; but Harris *et alii* (1958), in an investigation of 107 families, found only three examples of group 0–0 in a total of 472 individuals. Harris and his colleagues found also at least five children incompatible with their parents' haptoglobin types. These five children occurred in three closely related families, and one of the group 0–0 individuals also occurred in one of these families. As a result of these findings, Harris *et alii* suggest that another rare allele exists at the Hp locus, and they have named this Hp^0. Individuals who are $Hp^1\,Hp^0$ will be phenotypically group 1–1, those who are $Hp^2\,Hp^0$ will be group 2–2, and those who are $Hp^2\,Hp^0$ will be group 0–0. However, further studies of unusual families of the kind demonstrated by Harris will be needed to confirm the existence of the Hp^0 allele postulated by these workers.

One of the remarkable features of haptoglobin group distributions is the lack of any detectable heterogeneity in the Caucasian white population samples so far studied. The haptoglobin group frequencies in our Australian sample are almost identical with both the Danish sample of Galatius-Jensen and the Basque sample of Allison and his co-workers. It is possible that further work may reveal the existence of clines for the Hp genes in Europe, as has been done for the A B O and Rh blood group genes. In order to demonstrate such clines, however, large samples of each population will need to be investigated.

In contrast to the homogeneity in the Caucasian white samples, preliminary studies have revealed already significant differences in the haptoglobin group frequencies of other major ethnic groups. One of the problems of extending such studies is the difficulty of ensuring adequate

TABLE I.

Haptoglobin Group Distribution for Various Caucasian White Populations.

Author.	Population.	Number Tested.	Haptoglobin Group.			
			0–0	1–1	2–1	2–2
Smithies (1955)	Canadians	49 (100%)	—[1] —	10 21·1	25 50·5	14 28·4
Sutton, Neel, Binson and Zuelzer (1956)	Americans	54 (100%)	— —	6 11·1	29 53·7	19 35·2
Galatius-Jensen (1957)	Danes	1033 (100%)	— —	175 16·9	483 46·8	375 36·3
Allison, Blumberg and ap Rees (1958)	English	218 (100%)	6 2·7	22 10·1	121 55·5	69 31·7
	Basques	107 (100%)	1 0·9	15 14·0	49 45·7	42 39·3
Budtz-Olsen (1958)	Australians	100	—	14	58	28
Present series	Australians: Maternity cases	71 (100%)	— —	9 12·7	35 49·3	27 38·0
	Red Cross donors	323 (100%)	1 0·3	47 14·6	149 46·1	126 39·0

[1] "—" indicates 0–0 individuals not recorded.

TABLE II.

Sex and Age Distribution of Haptoglobin Groups of 323 White Australian Red Cross Donors.

Age (Years).	Haptoglobin Group.							
	Males.				Females.			
	1–1	2–1	2–2	Total.	1–1	2–1	2–2	Total.
Under 30	15	43	41	99	1	15	19	35
30 to 39	9	27	14	51[1]	4	11	13	28
40 to 49	5	11	11	27	3	18	9	30
50 and over	2	7	7	16	3	7	2	12
Not known	3	7	9	19	2	3	1	6
All ages ..	34	95	82	212	13	54	44	111

[1] One male, aged 36 years, classified as group 0–0.

transport of serum samples from the collecting site to the laboratory where facilities for starch gel electrophoresis exist. At normal air temperatures haptoglobins deteriorate within a few days, and even at 4° C. changes begin to appear in the haptoglobin pattern after one week. If the serum is kept at –15° C., however, the haptoglobins seem to remain unchanged, and we have studied samples kept in this way for at least a year. For collecting in other centres we have now established a satisfactory routine. (*a*) Either blood samples are collected into "Bayer" venules and sent by air in vacuum flasks packed with ice within 24 hours of collection, or (*b*) the cells and serum are separated after the clot has retracted, and the sterile serum samples are stored in a refrigerator until ready to be sent by air a few days later, also in vacuum flasks packed with ice.

TABLE III.

Observed and Expected Haptoglobin Group Distribution for 322 White Australian Red Cross Donors.[1]

Examples.	Haptoglobin Group.			Total.
	1–1	2–1	2–2	
Observed	47	149	126	322
Expected	45·84	151·30	124·36	322·00

[1] $\chi^2_{(1)} = 0{\cdot}07$: $0{\cdot}8 > P > 0{\cdot}7$.

We have recently examined the effects of freeze-drying fresh serum on the haptoglobins. Ten freeze-dried specimens kept at room temperature for a week showed no detectable difference in the haptoglobin patterns when compared with samples of the same sera kept at –15° C. For transport over long distances, therefore, staging to an intermediate laboratory where freeze-drying equipment is available may solve the problem of deterioration of haptoglobins with storage.

The foregoing comments on storage and transport are important also if haptoglobin grouping is to be added to the battery of blood-grouping tests used in medico-legal investigations. The family studies published so far adequately support the genetic basis for haptoglobin group determination, though the existence of a rarer Hp^0 allele, if it is confirmed, would reduce the effectiveness of exclusion in cases of disputed paternity. Further, it must be remembered that the Hp groups are often poorly developed or absent in new-born children, but that group determinations are possible in all but 3% of children by the age of six months (Galatius-Jensen, 1957). Despite these limitations, Hp grouping of human serum will certainly be of value in forensic medicine.

Finally, the existence of haptoglobin groups in man raises problems of wider interest. If the Hp groups represent another balanced polymorphic system, one may expect heterozygote individuals (group 2–1) to be at a selective advantage compared with either of the homozygous genotypes. This consideration suggests that longer term studies of differential fertility with respect to Hp types, or studies of the relationship between haptoglobins and disease, may well yield valuable information on the significance of this genetic polymorphism in human populations, in a manner similar to that yielded by studies of the associations between blood groups and disease or abnormal hæmoglobins and malaria.

Summary.

The technique of starch gel electrophoresis has been used to determine the haptoglobin groups of 394 white Australians. Statistical analysis reveals no significant difference in haptoglobin group frequency with age or sex. There is no significant difference between the haptoglobin group frequencies in the white Australian sample and the frequencies for other Caucasian white samples reported in the literature. Only one individual without haptoglobins was detected.

The problem of satisfactory transport of serum for haptoglobin group determinations in anthropological or medico-legal investigations is discussed. Preliminary findings suggest that freeze-drying and storage at room temperature do not affect the haptoglobins for periods of at least one week.

Acknowledgements.

Funds provided by the Research Grants Committee of the University of Western Australia enabled this investigation to be carried out. We are grateful to a number of people for advice, particularly Dr. G. C. Ashton, Dr. D. Curnow and Mr. W. J. O'Sullivan. Dr. P. Brain, Director of the Western Australian Red Cross Blood Transfusion Laboratory, made the samples of serum from Red Cross donors available to us, and Mr. G. H. Vos similarly provided samples of serum from maternity cases at the King Edward Memorial Hospital for Women.

References.

ABER, G. M., NEALE, F. C., and NORTHAM, B. E. (1957), "Binding of Hæmoglobin", *Brit. med. J.*, 2: 1368.

ALLISON, A. C., and AP REES, W. (1957), "Binding of Hæmoglobin by Plasma Proteins (Haptoglobins)", *Brit. med. J.*, 2: 1137.

ALLISON, A. C., BLUMBERG, B. S., and AP REES, W. (1958), "Haptoglobin Types in British, Spanish Basque and Nigerian African Populations", *Nature*, 181: 824.

BEARN, A. G., and FRANKLIN, E. C. (1958), "Some Genetical Implications of Physical Studies of Human Haptoglobins", *Science*, 128: 596.

BUDTZ-OLSEN, O. E. (1958), "Haptoglobins and Hæmoglobins in Australian Aborigines with a Simple Method for the Estimation of Haptoglobins", MED. J. AUST., 2: 689.

GALATIUS-JENSEN, F. (1957), "Further Investigations of the Genetic Mechanism of the Haptoglobins", *Acta genet. (Basel)*, 7: 549.

JAYLE, M. F. (1939), *"Thèse de doctorat en médecine, Paris;* quoted by Galatius-Jensen, F., *loco citato.*

HARRIS, H., ROBSON, E. B., and SINISCALCO, M. (1958), "Atypical Segregation of Haptoglobin Types in Man", *Nature*, 182: 1324.

LAURELL, C. B., and NYMAN, M. (1957), "Studies on Serum Haptoglobin Level in Hæmoglobinæmia and its Influence on Renal Excretion of Hæmoglobin", *Blood*, 12: 493.

OWEN, J. A., SILBERMAN, H. J., and GOT, C. (1958), "Detection of Hb, Hb-Hp Complexes and Other Substances with Peroxidase Activity after Zone Electrophoresis", *Nature*, 182: 1373.

POULIK, M. D., and SMITHIES, O. (1958), "Comparison and Combination of the Starch-Gel and Filter-Paper Electrophoretic Methods Applied to Human Sera: Two Dimensional Electrophoresis", *Biochem. J.*, 68: 636.

STEVENS, W. L. (1938), "Estimation of Blood Group Gene Frequencies", *Ann. Eugen. (Lond.)*, 8: 362.

SMITHIES, O. (1955*a*), "Grouped Variations in the Occurrence of New Protein Components in Normal Human Sera", *Nature*, 175: 307.

SMITHIES, O. (1955*b*), "Zone Electrophoresis in Starch Gels: Group Variations in the Serum Proteins of Normal Human Adults", *Biochem. J.*, 61: 629.

SMITHIES, O., and WALKER, N. F. (1955), "Genetic Control of Some Serum Proteins in Normal Humans", *Nature*, 176: 1265.

SMITHIES, O., and WALKER, N. F. (1956), "Notation for Serum-Protein Groups and the Genes Controlling their Inheritance", *Nature*, 178: 694.

SUTTON, H. E., NEEL, J. V., BINSON, G., and ZUELZER, W. W. (1956), "Serum Protein Differences between Africans and Caucasians", *Nature*, 178: 1287.

"IDIOPATHIC" HYPERTROPHY OF THE PYLORIC CANAL IN ADULTS.

By J. B. CLELAND AND E. J. O. GODFREY,
Adelaide.

THE term "pylorus", from the Greek for a gate-keeper, obviously applies only to the sphincter-controlled orifice between the stomach and the duodenum. That distinctive portion of the stomach immediately above the pylorus is variously known as the pyloric antrum or pyloric canal, or sometimes loosely merely as the pylorus of the stomach. In new-born infants it is a very definite structure, measuring usually about 1·2 to 2 cm. in length, sharply defined from the fundal part of the stomach. In so-called congenital pyloric stenosis, its muscular wall undergoes hypertrophy. Hypertrophy, sufficiently pronounced to be recorded in the autopsy summary, is found not infrequently in adults. Its incidence in seven successive thousands of post-mortem examinations in the Royal Adelaide Hospital between 1920 and 1948 was 2, 5, 1, 0, 0, 3 and 5—a total of 16 or just over 0·2%. An epitome of the autopsy findings in these 16 cases is given at the end of this article. Where the term hypertrophy of the pylorus has been used in the following notes, this means hypertrophy of the pyloric canal. It will be seen that most of these were in men and only two in women. The subjects were usually elderly, but two men were aged 36 years, one was aged 44 years and one 46 years. The associated pathological lesions were very varied and mostly seem to have no connexion with the hypertrophy of the muscle. The man with neuro-fibromatosis is a possible exception.

Presumably this hypertrophy of the pyloric canal is due to achalasia of the pyloric sphincter, requiring increased effort to force the stomach contents through an unresponsive or tardily responsive opening of the aperture. Are these examples in adults instances which began in infancy as milder forms of "congenital stenosis", or have they been acquired later? To what symptoms may the hypertrophy give rise?

Our attention has been redirected to these cases by the examination of the partly-resected stomach of a man aged 42 years, who had prepyloric stenosis from taking spirits of salts. We are indebted to the Chairman of the Repatriation Commission for permission to refer to this case. When the specimen came to be examined, considerable hypertrophy of the pyloric canal was found. As this was distal to the stenosis, it could not have been due to this and consequently must have had an independent origin. As there was no obstruction further on, the hypertrophy was presumably "idiopathic". It is possible that the symptoms from which he suffered before taking the acid—flatulence and gnawing epigastric pain eased by eating—may have been related to this hypertrophy of the pyloric canal or to the presumed achalasia that caused it, though these may have been due to adhesions.

Hypertrophy of the Muscle of the Pyloric Canal in 7000 Post-Mortem Examinations.

The following summaries have been extracted from "The Medical and Scientific Archives of the (Royal) Adelaide Hospital" under the heading "Stomach".

First Thousand:

1. No. 201/23, male, 67 years. Syphilitic (?) aortitis. Stenosis of coronary vessels. Fibrosis (presumably hypertrophy) of pylorus. Pulmonary œdema.
2. No. 38/25, female, 63 years. Squamous epithelioma of pelvis of kidney. Hypertrophied pylorus.

Second Thousand:

3. No. 98/25, male, 66 years. Carcinoma of prostate. Foul suprapubic wound. Uræmia. Hypertrophy of the pylorus and dilatation of stomach.
4. No. 27/27, male, 36 years. Multiple superficial scarring and ulceration of the small intestines. Scarring of duodenum probably of similar origin. Some hypertrophy of the pylorus. Sound gastrojejunostomy wound. Small abscess cavity in lung, probably from inhalation pneumonia. Shock following removal of part of jejunum.
5. No. 92/26, male, 59 (?) years. Lobar pneumonia. Early pericarditis. Small tuberculous cavity in lung. Acute gastric ulcer. Pyloric hypertrophy (? from achalasia).
6. No. 209/26, male, 63 years. Squamous epithelioma of œsophagus with stricture. Slight hypertrophy of pylorus (? achalasia, gastroenterostomy done). Distension of large gut. Syphilitic aortitis.
7. No. 143/27, male, 54 years. Extreme eczematous dermatitis. Some subacute glomerulonephritis with extensive fatty degeneration in renal cortex. Fatty perhaps slightly fibrotic liver. Some hypertrophy of pylorus. Toxæmia and alcoholism.

Third Thousand:

8. No. 70/32, female, 50 years. Greatly hypertrophied and dilated heart, weight with the aorta 37 ozs., attributed to essential hypertension, asthma and emphysema, chronic venous congestion, ante-mortem clots in large veins, infarcts in lungs. Slight hypertrophy of pylorus, probably from achalasia.

Fourth and Fifth Thousands:

None.

Sixth Thousand:

9. No. 119/43, male, 36 years. Hypertrophied and dilated heart (weight 20 ozs.), dilatation of ascending aorta and probably syphilitic aortitis. Base of left lung red and airless. Some hypertrophy of the pylorus from achalasia.
10. No. 135/43, male, 44 years. Fatty and fine cirrhosis of liver; had ascites and fluid in each pleural cavity, peritoneal adhesions, jaundice. Œdema and congestion of lungs. Hypertrophy of pyloric muscle.
11. No. 172/44, male, 67 years. Carcinoma of prostate with secondaries. Peritonitis. Hypertrophy of pylorus. Coronary atheroma. Gall-stones. Hæmorrhagic cystitis. Old infarct in spleen.

Seventh Thousand:

12. No. 67/47, male, 76 years. Irrational, wasted, dehydrated, blood urea N. 45 mgm. per centum. Dusky appearance with some hæmorrhages. Pylorus rather thickened yielding to the force of a little finger, stomach rather narrow, probably vitamin B defi-

ciency. Considerable emphysema. Rather large prostate.

13. No. 156/47, female, 72 years. Sudden onset of ataxia, weakness of legs, ? bulbar palsy. Coronary atheroma and fibrosis in septum. Hypertrophy of pylorus.
14. No. 285/47, male, 63 years. Bronchopneumonia. Old mitral stenosis. Infarct in right kidney. Thickening of pylorus.
15. No. 98/48, male, 46 years. Aortic stenosis and regurgitation with rigid cusps, much cardiac hypertrophy and dilatation, heart failure. Somewhat thickened pyloric ring.
16. No. 417/48, male, 60 years. Massive subcapsular hæmorrhage over right lobe of liver with leakage. Numerous vascular cysts in wall of small intestine and colon. Neurofibromatous nodules with freckle-like specks and café-au-lait patches on head, trunk and limbs. Nodule attached to small intestine. Firm plaque-like submucosal patches in anal canal. Hypertrophy of pylorus. Hypertrophied heart (weight 21 ozs.) with a vascular patch in wall.

Reports of Cases.

TWO UNUSUAL EYE ACCIDENTS.

By T. BOYD LAW,
Lismore, N.S.W.

THE following two cases are, I think, worth recording, not only because of their interest, but also because of the likelihood of their repetition under present-day conditions.

Case 1.

Mr. A., aged 32 years, was the front seat passenger, and, as is so often the case in these accidents, came in for the brunt of the injury when the curved windscreen of the *modern sedan car exploded like a shell into the faces of* the occupants. Both motor-cars (modern streamlined sedans) had been travelling at speed on a night of uncertain visibility and had met in an almost head-on collision. All the occupants of both cars received attention *for extensive injuries, and Mr. A's life was skilfully* saved by a doctor in an out-lying town, who arrested his severe facial hæmorrhage and gave him a blood transfusion. As he had sustained severe ocular damage, he was sent on to the Lismore Base Hospital as soon as was practicable (a matter of hours).

Examination of the patient on his arrival revealed innumerable cuts all over the face, but there was a deep wound immediately below the eyebrow on both sides. Bilateral ptosis was present, and this was not entirely due to the great swelling of both upper lids. The left eyeball was smashed beyond repair and presented no great problem as to the treatment. When the right upper eyelid was forced up, the eyeball was seen to be intact; the pupil reacted smartly to light; the fundus, as far as one could ascertain, was normal, and it was possible to elicit the fact from the drowsy patient that he could at least count fingers.

In view of the patient's condition, it was thought advisable to have an X-ray examination of the skull made before reparative surgery was embarked upon, and the extraordinary appearances seen in Figure I were disclosed. It was thought (and subsequently proved at operation) that the shadows were those made by fragments of the modern safety glass and that they had been driven well back into the orbit. It is to be noted that no glass or other foreign matter was detectable on the left side, in spite of the fact that the patient had sustained a deep wound under the left eyebrow, and also in spite of the fact that the left eye had been smashed. That there was no glass on this side is, of course, one of the vagaries of automobile accidents, which one has come to accept. In view of the possibility that the glass might have penetrated under these extraordinary circumstances through the roof of the orbit, Mr. N. E. Brand was called in to deal with any such eventuality.

FIGURE I.

At operation, fragments of glass of varying size and shape, but of the general pebbly pattern assumed by *broken safety glass, were removed. The fragments* were firmly wedged between the back of the right eyeball and the roof of the orbit, and it was only with some difficulty that the first pieces could be levered out with forceps. In all, 25 pieces were removed. The left eyeball was *removed, and a glass globe was inserted into Tenon's* capsule. A rapid suturing of the large orbital wounds was carried out, it being thought that the ptosis might *be dealt with at a later date and under more favourable* conditions.

Convalescence was reasonably uneventful, and the patient was, of course, greatly helped towards recovery by the antibiotics with which he was plied. At the end of a month the right eyelid was starting to move, and at the end of two months movement was observed in the left upper eyelid. The patient was able to recommence work about this time, and after he had been fitted with a

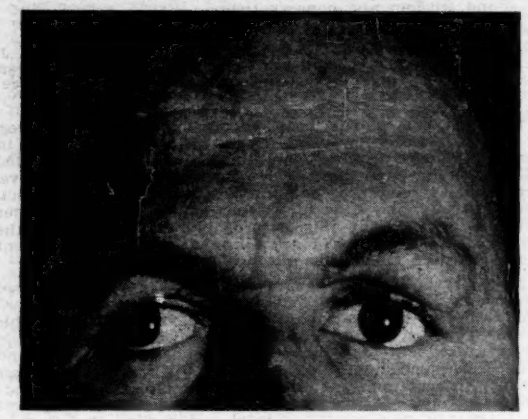

FIGURE II.

temporary artificial eye. No further surgery was required, and Figure II is from a photograph taken about ten weeks after the accident, and shows a face that has made a good recovery. The left eye is, of course, artificial.

Mr. A. has been seen again from time to time, and my notes show that the examination of his remaining eye one year after the accident disclosed no abnormality whatsoever. Visual acuity was 6/5, movement was unimpaired, the vitreous was quite clear and there was no retinal damage. Lid movement on both sides had quite recovered.

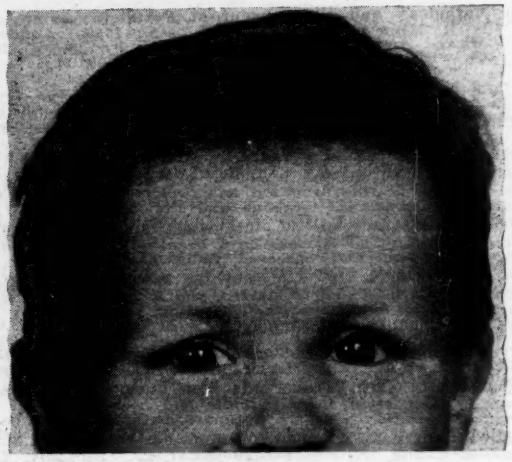

FIGURE III.

Case II.

This is the story of a small boy, B., aged eighteen months. While running with a glass in his hand (a frequent domestic pattern, I should say), he fell and broke the glass, and sustained immediately a deep wound extending from the side of the nose along through the lower lid to its lateral extremity. The wound penetrated the full thickness of the lid, and when it was retracted downwards the fact was disclosed that the eyeball also had been incised from approximately the 3 o'clock to the 9 o'clock position. The ocular wound was located about 5 mm. from the limbus, but in its lateral part it tended to veer away from the limbus. The ciliary body was, of course, prolapsed in at least part of the wound, and vitreous gaped along its full length. The lens appeared to have escaped injury.

So severe was the ocular damage that there was a temptation to remove the eye on the spot. However, to give the eye every possible chance—and after all, the wound was a very neat one, with no ragged edges—reparative procedures were decided on, if only as a temporary measure. Prolapsed uveal tissue was therefore removed, the sclera was sutured in the usual way with interrupted fine silk sutures, and the conjunctiva was closed with a running unknotted black silk suture. One million units of penicillin were injected under the conjunctiva, and the eyelid and face wound was repaired quickly, it being intended that this might be repaired more carefully at a later date and under more favourable conditions. The child was then returned to the ward, and the onset of panophthalmitis was confidently expected.

The next morning the child's condition was good. When the bandages were removed (with the assistance of the patient in spite of sedation), there was no swelling or redness, and the patient did not hesitate to demonstrate his ability to move the eye freely. Convalescence was uneventful, and the eye was never really inflamed. Nevertheless, in view of the severity of the lesion and the grim potentialities of sympathetic ophthalmia, cortisone was administered as soon as its exhibition was deemed suitable.

B. was examined in consultation by Sir Norman McAlister Gregg on January 6, 1958, and it was considered safe enough to retain the eye and to keep it under strict observation. The parents were also apprised of the danger, and of the necessity to report at any time if redness developed in either eye.

When the child was examined for the last time six months after the accident, the fundus was quite normal, there being no cells in the anterior chamber and no keratic precipitates. The tension was normal, and the only slight abnormality to be seen was the presence of some vitreous opacities. About this time the patient left the district, and the parents were fully instructed regarding the development of untoward symptoms and the need for further medical supervision. Figure III shows the condition of the child's eye some four and a half months after the accident.

Reviews.

The Functions of the Endocrine Glands. By Peter F. Hall, M.D., M.R.C.P., M.R.A.C.P.; 1959. Sydney: Horwitz Publications Inc. London: Pitman Medical Publishing Company, Limited. Philadelphia: W. B. Saunders Company. 8½" × 5", pp. 308, with 77 illustrations and 2 tables. Price: 70s.

THIS book was written for those primarily interested in physiology, and the author has not sought to achieve a "stop-press" effect (author's preface). The presentation gives the impression of undergraduate lectures, and the book is perhaps best regarded as a précis for a lecturer wishing to expound the subject. The introduction is perhaps too brief to be adequate.

There are 14 actual chapters, the first dealing with hormone chemistry, which is a wise addition in view of contemporary emphasis, and the last briefly considering steroid metabolism. The chapter on the adrenal cortex is reasonably comprehensive; but it is doubtful whether the statement that "the recent literature on this subject is fully and critically reviewed in 'Recent Advances in Endocrinology', published in 1954" is tenable. The usage adopted for the term corticosteroid is not customary, but this is indicated; the section dealing with the actions of corticosteroids appears somewhat confused, presumably because pharmacological and physiological effects are not sufficiently defined or separated in the discussion. Some students, not unreasonably, will require a more lucid account of the methods for estimation of these steroids

than that given. The chapter on the thyroid gland is well orientated, but again suffers from the difficulty of inadequate delineation of physiological effects of its hormone(s). The gonads are considered in separate chapters, along customary lines, that on the ovary being quite extensive. The breast, as an end-organ, is given a separate chapter. The terminology adopted for the section on the pituitary gland is adenohypophysis and neurohypophysis, the titles of two chapters. Of necessity that on the adenohypophysis overlaps some other discussions; some disputable interpretations are presented without the detracting evidence. The chapter on the neurohypophysis includes a section dealing with the role of the endocrine glands in water balance. Reasonably extensive chapters are devoted to the adrenal medulla and internal secretions of the pancreas, including carbohydrate metabolism. A chapter is given to the parathyroid gland (surely, glands), and follows orthodox lines; but no reference more recent than 1948 is listed. The endocrine factors in growth, maturation and decline are wisely given a chapter; the analysis of the glucocorticoid function upon somatic growth will not be adequate for everyone. A discussion of the nervous control of the endocrine glands is essential for an understanding of some endocrine processes, that given being basically a summary of the work of G. W. Harris. A number of chapters overlap, but this is difficult to preclude in the form of presentation adopted. Also, a book on this subject, which is by intent restricted to normal functions, must lose significantly by exclusion of much abnormal function.

The index is adequate. A number of illustrations are of poor quality, presumably owing to printing difficulties, as the originals are clear. The book at 70s. (Australian) is too dear for what is essentially an undergraduate summary of endocrine physiology.

Electrocardiography. By Michael Bernreiter, M.D., F.A.C.P.; 1958. Philadelphia, Montreal: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 9" × 6¼", pp. 350, with 92 figures and 1 table. Price: 55s.

THIS book is meant to supplement a series of lectures delivered to graduates and students at St. Mary's Hospital, Kansas City, U.S.A., and is briefly a re-presentation of the Goldberger concepts, which include a drawing of the heart represented with the right ventricle on the right, the septum and then the left ventricle on the left. This fictionalized concept of the heart has been amply discounted by the work of R. P. Grant, who studied the anatomical position of hearts, fixed in situ, and found that the septum lay virtually in the frontal plane and that the transitional zone did not always coincide with the septum. We regret that we cannot recommend this book.

British Obstetric and Gynæcological Practice. Edited by Sir Eardley Holland, M.D. (Lond.), F.R.C.P., F.R.C.S., F.R.C.O.G., and Aleck Bourne, M.A., M.B., B.Ch. (Cantab.), F.R.C.S., F.R.C.O.G.; Second Edition; 1958. London: William Heinemann (Medical Books), Limited. 9¼" × 7", pp. 904, with many illustrations. Price: 105s. (English).

IN this second edition the editor, an acknowledged leader in his field, has endeavoured to present an up-to-date review of gynæcology as practised in Great Britain today, and in this he has enlisted the support of 20 other contributors, many world-famous, drawn from the teaching centres of that country. Included in this gynæcological oligarchy are anatomists, a psychiatrist, a venereologist and a barrister, and thus is ensured a comprehensive study of the subject from all its viewpoints. Despite the many sources from which the book is compiled, a general unity and orderly sequence are preserved in the presentation of the subject matter, and in a style which is in the circumstances remarkably uniform. As the book is essentially of a practical nature, all descriptions of physiology and pathology are restricted to what is necessary for clinical application. It is well illustrated with diagrams and plates, and contains much sound advice on surgical procedure, technique, difficulties and dangers, although it makes no claim to be a manual of operative gynæcology. The co-authors have been allotted subjects in which they are acknowledged experts, and thus each chapter is authoritative and original, comprehensive and sound, and completed by an extensive bibliography. Old theories are subjected to a very objective appraisal in the light of subsequent knowledge and experience, and dramatic claims for successful new treatments and cures are recorded with characteristic reserve. As the editor states, this attitude of "hesitant acceptance of innovations" has not always been in the best interests of medicine; but in the final analysis there is no doubt that it tends to separate the wheat from the chaff.

Although only a few years have elapsed since the publication of the first edition of this book, extensive revision has been necessary to incorporate new advances and ideas, and some chapters have been largely rewritten, so that it has become a mirror of current British gynæcological thought and teaching. To those who practise gynæcology this volume has much to offer, with its wealth of sound wisdom and conservatism.

Medical Museum Technology. By J. J. Edwards and M. J. Edwards, 1959. London: Oxford University Press. 8½" × 5½", pp. 186, with many illustrations. Price: 39s. (English).

THE first part of this book, consisting of some 70 pages, is an historical survey of natural history museums in general and of medical museums and their associated techniques in particular. The account is comprehensive, and includes reference to many key works on the subject. Unfortunately, the style of writing makes this part rather difficult to read, but this is probably due mainly to the condensation that has been found necessary to prevent these chapters from becoming too lengthy.

Most of the rest of the book gives a good account of modern medical museum techniques, and it is obvious that the authors have had many years of experience in this work. The text contains much practical advice, and should be of great help to technicians of limited experience, and even those accustomed to museum work will find some useful information. Injection techniques and solid-mounting methods are up to date, and the descriptions of these are particularly helpful. Likewise the Gough-Wentworth technique for the paper mounting of large sections is adequately described.

The last chapter on the organization of the medical museum is disappointing and would have been better omitted, except for the advice on the design of modern display units and the castigation of the old-fashioned heavy-timbered cabinets of the Victorian era.

On the whole, the book will have a limited appeal; but a copy should certainly be purchased for all medical museums, for it will be found to be time-saving in the long run. Moreover, if the advice offered is followed, many valuable and unique specimens may be saved from destruction, and may even be restored to their pristine beauty.

The Pathology and Management of Portal Hypertension. By R. Milnes Walker, M.S., F.R.C.S.; 1959. London: Edward Arnold (Publishers) Limited. 9" × 5½", pp. 124, with 39 illustrations. Price: 35s. (English).

THIS book by Professor Milnes Walker of Bristol is a monograph of the highest order. The subject is an abstruse one, which has engaged the attention of some of the finest intellects in academic medicine over the past decade. The condition of portal hypertension is not reproducible in experimental animals, so that much of the investigation of this condition has perforce been made by clinicians—physicians, surgeons and radiologists, with the constant assistance of the biochemist and hæmatologist. Words, written and spoken, have been so freely expended on the subject, and observed facts have remained so obstinately scarce, that many of the workers in the field have felt confused and frustrated, and have translated this condition into indecision when treating the complaint in all its complexities and ramifications.

The virtues of this publication are threefold. Firstly, the author speaks with the assurance of a wide personal experience of over 200 patients seen during the last ten years. As most of these patients had been submitted to surgical operation and the intimate pathology had been studied at first hand, the presentation has the ring of quiet confidence and true knowledge about it. Secondly, the clarity of the supporting illustrations is quite remarkable. X-ray films of gross œsophageal varices, transplenic venography and cineangiography are presented in a fashion which is a credit both to the radiologist and to the publishers. There is a double-sided page of colour reproduction, showing both the gross and the microscopic appearances of the liver in the various conditions causing intrahepatic obstruction, which is particularly well done, and because of its excellence is most valuable. The demonstration of the steps of operation in unfamiliar procedures, such as porta-caval and spleno-renal anastomosis, is skilfully managed by the conjunction of simple line diagrams with black and white shots taken during

the course of operations. This has allowed the best of both methods of presentation of this difficult subject to be acquired, and has answered the objections that are currently given to either method used singly.

The third major virtue is the clarity and conciseness of the text. This has a truly surgical flavour about it, and much of the prolixity which has been such a feature of contributions on this subject has been avoided. We found it extremely easy to read—not unduly concentrated, but concise to the point of neatness. Professor Milnes Walker's remarkably successful clinical results—a series which cannot be bettered anywhere else in the world—mirrors the great modesty of the author himself in their presentation. This is to be recommended as an essential work for anybody interested in this topic, and as a medical monograph which can be regarded as a model of excellence.

Recent Advances in Respiratory Tuberculosis. By Frederick Heaf, C.M.G., M.A., M.D., F.R.C.P., and N. Lloyd Rusby, M.A., D.M., F.R.C.P.; Fifth Edition; 1959. London: J. & A. Churchill Limited. 8" × 5", pp. 292, with 6 plates and 14 text-figures. Price: 35s. (English).

TEN YEARS have passed since the fourth edition of this book was published, and the fifth is an entirely new compilation. There are 13 chapters, including one on respiratory function by Dr. C. M. Ogilvie. Others deal with epidemiology, prevention, tuberculin, B.C.G., chemotherapy, collapse therapy, resection, primary tuberculosis, radiography and rehabilitation. Each chapter is followed by a list of references. The book thus gives a useful conspectus of the subject—if a somewhat soulless one, made up as it is of abstracts from the literature strung together with comment. Acknowledgement is made in the preface of help in assembling some of the material.

The decade just past has been a less exciting one than its predecessor as regards discovery in the field of tuberculosis, though it has seen the fruition of previous advances in the decline in mortality from tuberculosis in nearly all countries. Still, the authors do not believe that this gives cause for complacency. The eradication of the disease may now depend in some measure on international cooperation as well as on national endeavour. This is implicit in the authors' advice that all persons migrating from an area of low incidence of infection to one of high incidence should receive B.C.G. vaccination. In matters of therapy, the impersonal character that this book has assumed is most apparent. The authors express no preference for surgery or chemotherapy in the management of primary lesions. They are cautious in their appraisal of the value of corticosteroid hormones as an adjuvant to chemotherapy, and state that their use is hardly out of the stage of clinical trial; but they seem in no doubt of the value of the combination in the treatment of pleural effusion.

Treatment of Malignant Blood Diseases by Radioactive Phosphorus: Part I. Clinical Aspects. By Ingmar Bergström and Erik Lindgren; Acta Radiologica, Supplement 150; 1957. Stockholm: Acta Radiologica. 9½" × 7", pp. 107, with 23 illustrations and 10 tables. Price: Sw. Kr. 25.

THIS is an account of the management of 88 cases of leukæmia with phosphorus 32 (P^{32}) during the period 1948 to 1955. An analysis has been made of the material under several headings—for example: periods of survival; evidence of heredity on the incidence of cancer; the effects of the treatment on the course of the disease, from the point of view of both symptoms and signs and post-mortem observations. A tabular summary of the clinical history of each individual patient is included. There is a comprehensive survey of the literature up to 1955. The procedures used have been orthodox, and the results of the analysis are not unexpected.

The Histological Distribution of Proteinase and Peptidase Activity in Solid Tumor Transplants: A Histochemical Study of the Enzymic Characteristics of the Different Tumor Cell Types. By B. Sylvén and H. Malmgren; Acta Radiologica, Supplement 154; 1957. Stockholm: Acta Radiologica. 9¼" × 7" pp. 124, with 19 illustrations and seven tables. Price: Sw. Kr. 30.

THIS is a 123-page review and original thesis, which attempts to investigate the cause of spread of malignant tumours by infiltration, as distinct from metastasis. The primary aim was to study the distribution of proteolytic enzyme activities in situ in growing and non-growing tumour cell regions. The authors have gone to great trouble to study active as distinct from necrotic tissue, and they have evolved a histochemical serial section method of appraisal of the tissue cores later used for biochemical analysis. These analyses consist of the assays for catheptic (with and without activator) and dipeptidase activities, and total protein content of the sections (5 to 10 μg. of protein per section). The analyses thus are in the ultra-micro region. The authors conclusions, from the study of a number of different animal "uni-centric" tumours, support the thesis that actual growing tumour cells at the periphery contain high levels of intracellular protein-splitting enzymes and peptidases, usually exceeding normal cellular levels many times. The possibility of altered permeability of tumour cells may allow these enzymes to attack the surrounding normal tissue. Some criticism could be made of the unphysiological substrates used, and it seems that more might have been gained from a thorough examination of histochemical methods for the same reactions. This rather extended paper describes a valiant attempt to investigate this intractable problem. It should be regarded as a preliminary study for a more detailed approach to this subject.

Epilepsy Handbook. By Frederic A. Gibbs, M.D., and Frederick W. Stamps, M.D.; 1958. Oxford: Blackwell Scientific Publications. 8¾" × 5½", pp. 114, with illustrations. Price: 36s. (English).

THIS concisely written and essentially practical volume is designed to provide the busy practitioner and specialist alike with ready answers to the many problems that a patient with epilepsy presents. Sixteen chapters and a comprehensive index are included in the 114 pages, so it can be used with ease as a reference volume. Theory and discussion have been kept to a minimum, and the illustrations are mainly restricted to appropriate and simplified electroencephalographic tracings.

The opening chapters are devoted to a brief and elementary discussion of the nature of epilepsy, its causation, the types of seizures encountered and the role of electroencephalography. Individual varieties of epileptic disorders are dealt with in the following nine chapters, and the authors employ a mixed clinical and electroencephalographic classification in an attempt to correlate the clinical and electroencephalographic phenomena. Although the purist may object to such a mixed classification, it does at least provide a practical approach to the separate clinical entities encountered, and the practitioner should find the associated electroencephalographic phenomena more readily understandable. The essential clinical features of each group are described, and reference is made to ætiology, prognosis and treatment. Illustrative electroencephalographic tracings are included where appropriate. The next chapter is a valuable one which deals with the differential diagnosis of conditions resembling epilepsy, whilst the latter section is devoted to treatment and counselling. The practitioner should find the chapter on therapy of particular value. Each currently available anticonvulsant substance is considered in turn, and although the account is essentially brief, the reader will find it comprehensive. The indications for usage, mode of administration, dosages, toxic reactions and possible dangers for each are described in a precise and logical manner. Status epilepticus and associated behaviour disorders are also described, whilst the short chapter on counselling includes such problems as marriage, children, schooling, employment and recreation. The frontispiece contains a coloured illustration of the tablets and capsules discussed—a practice to be encouraged.

The practitioner should find this readable book of interest and value.

Practical Microscopy. By L. C. Martin, D.Sc., A.R.C.S., D.I.C., and B. K. Johnson, D.I.C.; Third Edition; 1958. London: Blackie and Sons, Limited. 7¾" × 4¾", pp. 150, with many illustrations. Price: 12s. 6d.

THIS book, the first edition of which was published nearly 30 years ago, is a useful introductory treatise on microscopy. On the more important topics, it contains enough theory to give meaning to practice and enough practical instructions to keep the theory from becoming too sterile. It is a book recommended for purchase by medical students in the University of Sydney.

The differences between this and the second edition are relatively minor. Slight expansion of some sections and the addition of one or two new ones have increased the length of the book by 13 pages.

It must always be difficult for authors of books like these to decide whether to say a little about most things or more about fewer topics. The present authors have

chosen the former approach, and have generally done their work well. For example, there is a lucid exposition of the theory of interference microscopy, although only the Dyson instrument is mentioned. On the other hand, although there is a long section on ultra-violet microscopy, which goes into considerable technical detail, there is no mention of ultra-violet microspectrophotometry of the "Caspersson" type. Neither is there any mention of histophotometry and cytophotometry of stained biological specimens in visible light. This to a biologist seems a rather serious omission.

In our opinion, the least satisfactory section is the one on photomicrography. The discussion is here confined to apparatus of the optical bench-plate camera type, which must surely seldom be used nowadays. Bare mention is made of 35 mm. equipment, which, because of its versatility, its convenience and the low cost of the photographic materials, is the modern method of choice. An appendix giving detailed instructions on how to take a photomicrograph by a peculiarly primitive method is found at the end of the book. There is also an appendix on light sources, which is useful as far as it goes, but which does not mention xenon arc or electronic flash sources.

Wolff's Diseases of the Eye. Revised by Redmond J. H. Smith, D.O. (Eng.), M.S. (Lond.), F.R.C.S. (Eng.); Fifth Edition; 1959. London: Cassell and Company Limited. 9¾" x 7", pp. 238, with 150 illustrations. Price: 42s. (English).

IT is always difficult to write a textbook on diseases of the eye for general practitioners and undergraduates. What to include and what to omit are problems which exercise the judgement of the most competent author. The present book is one in which this difficulty has been overcome, for here indeed is a text admirably suited for those for whom it was written.

There are 24 excellent chapters, and all contain enough information to give the reader an insight into ophthalmology without causing confusion. The young opthalmologist, also, will find that the book contains much to help him in his early days. Many rare and less common conditions are mentioned and briefly described in small type, and these sections may be omitted by the undergraduate.

The book is well illustrated with colour plates and a profusion of black and white diagrams, all of which show evidence of careful selection. The text is free of errors, and the type is large and makes for easy reading. The publishers are to be congratulated on a beautiful production which on present-day costs may be regarded as more than reasonably priced. This book can be highly recommended to the undergraduate and general practitioners.

Bailey's Textbook of Histology. Revised by Wilfred M. Copenhaver, Ph.D. (Editor) and Dorothy D. Johnson, Ph.D.; Fourteenth Edition; 1958. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9¾" x 6¼", pp. 648, with 478 illustrations. Price: £6 1s.

THE chief feature of this textbook (now in its 54th year) has been that it treats standard medical histology at a level suitable for the average junior student. It is not difficult to question whether this is a real merit. Books like this seem to us to be unsatisfactory on two grounds. In the first place, the very real need that students and practitioners of pathology have for a modern authoritative and more exhaustive text in English on normal histology is overlooked. In the second place, little regard is paid to the needs of the better student. The latter will find many of his questions unanswered, unless he takes the rather unusual step of consulting the literature quoted in the reasonably adequate bibliography. There is little inducement for him to do this because there is no reference in the text to specific titles.

Within its limits this book is quite a good one. The authors' aim in the present edition has been to revise the standard structural details in the light of electron microscopy, histochemistry and tissue culture, and further to revive the functional slant which was such an important feature in histology in the nineteenth century.

The authors have done their job well. A large number of very good quality electron micrographs are included, although they are often left to explain themselves. For example, there is no discussion in the text on the structure of cilia, but one of Fawcett and Porter's electron micrographs of cilia is included. Similarly a few excellent micrographs from Low's blood atlas are included, but scarcely referred to in the text.

The section on nervous tissue is the most modern in its approach. It includes statements about Geren's hypothesis of myelin sheath formation and about the structure of synapses. It is very doubtful, however, whether Geren would accept figures 123 and 124 as representing a true statement of her views. The section on the nervous system seems disproportionately large (63 pages) when compared with, for example, those on the vascular and lymphatic systems (26 pages each).

The least satisfactory section is the one on epithelia. Not only is this taxonomically inadequate, but it contains scarcely a word about the functions of epithelial cells or about the structural specializations associated with such functions. The section on glands is scarcely any better, and the section on connective tissue, although it may have sufficed in the past, does not reflect the more modern interest being taken in this former Cinderella of the tissues.

A Laboratory Manual on Abnormal Hæmoglobins. Prepared under the direction of I. H. P. Jonxis and T. H. J. Huisman; 1958. Oxford: Blackwell Scientific Publications. 8¾" x 5½", pp. 44, with 12 illustrations and two tables. Price: 9s. 6d. (English).

THIS short manual contains a wealth of practical and a good deal of theoretical information. Since Pauling's discovery in 1949 that the hæmoglobin of patients suffering from sickle-cell anæmia differs from normal hæmoglobin, there has been a rapid increase of our knowledge of abnormal human hæmoglobins, of which now more than 12 are known. They are of great interest, not only for the correct diagnosis of hæmoglobinopathies, but also for the biochemistry of genetics and for physical anthropology.

After a description of the hæmoglobinopathies, whose clinical and hæmotological features are summarized in a table, the physico-chemical techniques for the identification of the hæmoglobin types, from the preparation of the sample to separation and identification by various electrophoretic and chromatographic procedures, are fully set out. The detection of fœtal hæmoglobin by the alkali denaturation method is also described. The authors have to their credit important contributions to the development of these techniques, which guarantee the excellence of this, the most essential chapter of the booklet. A table summarizes the biochemical characteristics of the various hæmoglobins. A short chapter on the more important hæmatological techniques concludes this very useful little book.

Practical Obstetric Problems. By Ian Donald, M.B.E., M.D., B.S. (Lond.), B.A. (Cape Town), M.R.C.S. (Eng.), L.R.C.P. (Lond.), F.R.F.P.S. (Glas.), F.R.C.O.G.; Second Edition; 1959. London: Lloyd-Luke (Medical Books) Limited 8¾" x 5½", pp. 728, with many illustrations. Price: 55s. (English).

FOUR years ago the first edition of this book was commended as a first-class publication for the practitioner in obstetrics. The second edition, now published, is not merely a revision of its predecessor. It incorporates much relevant knowledge gained from recent research and clinical experience, and it is a really comprehensive volume which fully meets the needs of the obstetrician from the practical angle. Indeed, it must be stamped as one of the finest books extant for this purpose. Donald's style makes for easy reading, while his emphatic teaching is both convincing and concise. He characteristically rejects much that has been handed down by tradition with the old Scottish phrase "not proven", and his quotation of Rodway's report on ante-natal exercises is a case in point. Afibrinogenæmia, the details of X-ray placentography, the modern approach to anuria—these are selected examples of new work, the inclusion of which brings the book really up to date. The collaboration of experts in their field enhances the authority of any work, and the author has been well rewarded by the contribution of several chapters by friends engaged in those ancillary departments of medicine which play such a vital part in the intelligent conduct of obstetric practice. The post-graduate student and the practising obstetrician will profit from the addition of this volume to their library.

The Symptoms as Communication in Schizophrenia. Edited by Lieutenant-Colonel Kenneth L. Artiss, M.C.; with four contributors; introduction by David McK. Rioch, M.D.; 1959. New York and London: Grune & Stratton, Inc. 8½" x 5", pp. 240. Price: $5.75.

THIS book deals with the effect of *milieu* therapy on young army patients suffering from what was taken to be their first schizophrenic episode, and it includes a study of the family histories and precipitating events and a

follow-up investigation of those who were returned to duty.

The field of study was a group of 11 young men admitted to hospital from three to 12 weeks after their induction. The authors take up enthusiastically this new dynamic approach to the most classical of mental illnesses, the treatment of which has hitherto been so predominantly physical. Even so, past experience suggests that this may be the real value of their contribution, rather than their current clinical results. Nurses and technicians were closely connected with the treatment, and their observations are recorded.

The authors present an abundance of case material lending support to their contention that the schizophrenic symptom is not merely the adventitious expression of disorder of thought, but a purposive goal-directed manifestation which could be regarded in the same way as the symptom in the neurotic. They suggest that the schizophrenic courts rejection from the group in such a way that he can maintain his dependency, but not lose his freedom. It becomes clear that these authors look at the schizophrenic not so much as a sick man, but more as an individual reacting specifically to social group demands which he cannot meet.

This study has been very thoughtfully planned and launched, but unscientifically executed, and the conclusions can be regarded as established at the level of clinical observation only; there is nothing approaching proof of their conclusions. It is not written well enough for the meaning always to be clear. It is a book for many libraries, but for few individuals.

Christ and Freud: A Study of Religious Experience and Observance. By Arthur Guirdham, M.A., D.M., B.Sc. (Oxon.), D.P.M., with a preface by Lawrence Durrell. London: George Allen & Unwin Limited. 8¼" × 5", pp. 196. Price: 21s. (English).

A MORE accurate title for this book would have been "Buddhism, Hinduism, Christianity and Freud", or "The Advantages of Far Eastern Mysticism over Western Organized Christianity in the Production of Mental Health". Dr. Guirdham, a psychiatrist, states in his introduction that "the aim of this book is to study the psychiatric foundations of religion and also, conversely, to estimate to what extent religious factors are important in relation to psychiatric conditions and more especially to neurosis". He believes in a religion of mystical experience, in which the individual does not regard himself as a self-contained entity with complex social relationships, but as a part of the universal spirit which is in all things and which exists beyond considerations of space and time. We must reduce our self-awareness, we must annihilate our egotistical social and dynamic personalities, and a higher self which is part of the universal spirit will be set free. All diseases, and much guilt and depression, are the converse of this, being associated with a heightened perception of ourselves as individuals. He insists that organized Christianity, theology and psychoanalysis encourage this unhappy state of affairs, and he accepts the claims of Christ and Freud only in so far as they are consistent with Far Eastern mysticism, which, he claims, is productive of much less neurosis. He supplies no statistics as to the relative incidence of neurosis in the Far East and the West, to support his thesis.

He gives a useful and penetrating analysis of the egocentric and obsessive-compulsive elements in the ecclesiastical and theological history of Christianity, but says little about its positive, healthy contributions. In fact, he seems so obsessed with these obsessional elements that one wonders whether he himself is unconsciously reacting against a strict sectarian upbringing. At all events, the book fails to give an objective and balanced survey of Christianity, Buddhism, Hinduism or psychiatry and their possible interrelationships, and those clergy and psychiatrists who can find time to peruse its pages are likely to be disappointed.

Radioactive Isotopes in Clinical Practice. By Edith H. Quimby, Sc.D., Sergei Feitelberg, M.D., and Solomon Silver, M.D.; 1958. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9¼" × 5¾", pp. 452, with 97 illustrations. Price: £5 10s.

THREE sections make up this book. The first deals with physical considerations in regard to clinical uses of isotopes and is from the pen of Mrs. Edith Quimby; it covers the relevant physics in the capable fashion that is to be expected of this experienced physicist, who is to be commended for the clarity of her writing. Representative calculations concerning all the common estimations associated with routine clinical isotope tracer and therapy administration are a striking feature of this section. Chapters on radiation hazards and their avoidance and on radioactive waste disposal summarize current American practice.

Dr. Feitelberg contributes the second section, in which he considers instrumentation and laboratory methods. The varieties of radiation detectors and the basic measurements which can be made with them are fully discussed. Qualitative measurements *in vitro* and *in vivo* next receive consideration. The section concludes with studies on isotope distribution and autoradiography, problems of health protection, and isotope and laboratory design.

The third section of the book is by Dr. Silver, who devotes the greater portion of his space to the study of the thyroid gland and radio-iodine. The whole of this section is written for the interested clinician with little mathematical training. Dr. Silver obviously brings to his work a great clinical experience, and the chapters on the uses of radio-iodine in diseases of the thyroid cover all phases of the subject. This is an excellent exposition, and no better review of this subject has been seen elsewhere.

The concluding chapters on the uses of P^{32}, studies with radioactive iron and the uses of isotopes in studies of the circulation, are somewhat scrappy in comparison, and the lack of practical detail detracts from the value of the section. The attempt in the last few chapters to cover the remainder of the field of clinical uses of isotopes fails somewhat because of its compression.

In all, the authors have done an excellent job, and the volume is to be recommended to those whose clinical work involves the use of radioactive isotopes in any form.

A Search for Man's Sanity. The selected leters of Trigant Burrow, with biographical notes prepared by the Editorial Committee of the Lifwynn Foundation; William E. Galt, Chairman; with a foreword by Sir Herbert Read; 1958. New York: Oxford University Press. 8¾" × 5¾", pp. 640. Price: $8.75.

"A SEARCH FOR MAN'S SANITY" is the title of a book of selected letters by an American psychiatrist, the late Trigant Burrow. Since he was an indefatigable correspondent, it has been possible to create an instructive biography. His delightful epistolatory style results in an intimacy which is realistic and effective. An early pupil of Freud, he was active in founding the American Psychoanalytic Association, and regarded himself as a faithful practitioner in psycho-analysis. The letters to Freud show an intense desire to regard his work in group analysis as a legitimate extension of the Freudian viewpoint, but it was not to be. Freud resented any deviation from orthodoxy, and did not support the work. As a result, Dr. Burrow had to steer a lone course. The Burrow thesis is well summarized in a foreword by Sir Herbert Read:

> It points to the anciently recognised truth that man is not a detached particle of life, pursuing a separate orbit, but that we are part of one another. From that fact it follows that the analysis of the individual can never be completed without a consideration of the group of which he is an organic part. His very resistances to analysis are social resistances, and it is these social resistances, buried deep in the unconscious, that must be exposed.

Dr. Burrow launched the social experiment of group psycho-analysis and made it his life work. His colleagues, students and patients lived for periods together at Lifwynn Camp. Later, houses at Baltimore and New York served as a psychological laboratory. Participants paid for board and lodging; they helped in house management and had their meals together. All had had a private psychoanalysis. In the group, the procedure of individual psychoanalysis was reversed; the united societal consciousness became the critique in respect to the individual, whether doctor or patient. The group, in fact, analysed the psycho-analyst.

Group techniques called for complete truthfulness between the members. The difficulties are briefly outlined in the Lifwynn presidential address by Clarence Shields, an intimate co-worker of Trigant Burrow:

> When we came actually to work together in the same office, then little by little as was inevitable in a programme of mutual analysis, the unexpected began to happen. Briefly, the "I"-persona—to use the term Dr. Burrow coined later—the "I'-persona of each intruded upon the scene. Neither could brook the observations of the other. Our relation became strained.

Such an experience highlights the basic problems of social living. It is not sufficient to know ourselves; we must know what the other person thinks of us, then harmonize the two points of view. With this background, the combination of a brilliant psycho-analytic mind and equally brilliant penmanship makes fascinating reading.

A few extracts from letters to members of Burrow's family illustrate the writer's frank approach to interpersonal problems:

> But about marriage. What I said of marriage, I said of marriage as ownership. And marriage is ownership—let's face it. I think no two people were ever more stupid and reluctant to face this unsavoury actuality in their lives than my wife and myself, but we have kept at it, and the deeper understanding and sympathy and confidence that have come of it, I count among the richest meanings of the many rich meanings that life has brought to me.
>
> It seems to me you are too intelligent to act unintelligently because everyone else is doing so. And I mention this for whatever use you may be able to make of it in the midst of the very sick social conditions into which you have been thrown as part of a social neurosis existing at present everywhere.
>
> The conflict, which you and Emily assume to exist in the attitude of your mother and me toward one another, is not there. The conflict is one that is wholly internal to himself on the part of each of us. Your tendency—yours and Emily's—to "side" surreptitiously first with this one and then with that one, is merely your own conflict—ever vacillating between your own vain projections of it.

In conclusion, "A Search for Man's Sanity" tells the story of a brave man s search for truth and human betterment in the face of great difficulties. For the psychiatrist, it sheds light on the evolution of the psycho-analytic concept through the writer's correspondence with the giants of the early psycho-analytic movement; for the reader with a smattering of psychological knowledge, there is the message of a fight against adversity, a belief in the worthwhileness of our social contacts and an intense desire to find a sane approach to everyday living.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Care of the Surgical Patient", by Jacob A. Glassman, M.D., F.A.C.S., F.I.C.S., and Raymond W. McNealy, M.D., F.A.C.S., F.I.C.S.; 1959. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9x " 6", pp. 328. Price: 71s. 6d.

"Principles of Disability Evaluation", by Wilmer Cauthorn Smith, M.D.; 1959. Philadelphia and Montreal: J. B. Lippincott Company. Sydney: Angus & Robertson, Limited. 9" x 6", pp. 224. Price: 77s.

"Chirurgisches Nahmaterial: Eigenschaften, Sterilität und deren Prüfung", by H. Hudemann; 1959. Jena: Veb Gustav Fischer Verlag. Sydney: Angus & Robertson, Limited. 9¼" x 6¼", pp. 144, with illustrations. Price: DM 13.50.

"Der Alkoholismus als soziales Problem", by H. von Keyserlingk; 1959. Jena: Veb Gustav Fischer Verlag. Sydney: Angus & Robertson, Limited. 8¼" x 6", pp. 91. Price: DM 5.

"Epifiza—Glanda Endocrina", by St.-M. Milcu; 1957. Roumania: Editura Academiei Republicii Populare. 9¼" x 6¼", pp. 114. Price not stated.

"Somatic Complications Following Legal Abortion", by J. Lindahl; 1959. London: William Heinemann Medical Books Limited. 9¼" x 6¼", pp. 182. Price: 42s.

"Gusa Endemica: Distrofia Endemica Tireopata, Cercetari Monografice, Clinice Si Experimentale", sub redactia, Acad. St.-M. Milcu, Volume 2; 1958. Roumania: Editura Academiei Republicii Populare. 9¼" x 6¼", pp. 454, with many illustrations. Price: not stated.

"Endocrinologia Glandelor Salivare", by Acad. C. I. Parhon, A. Babes si I. Petrea; 1957. Roumania: Editura Academiei Republicii Populare Romine. 10" x 6¼", pp. 318, with 185 illustrations. Price: not stated.

"Gusa Endemica; Distrofia Endemica Tireopata. Cercetari Monografice, Clinice si Experimentale", sub redactia, Acad. St.-M. Milcu, Volume 1; 1957. Roumania: Editura Academiei Republicii Populare Romine. 9¼" x 6¼", pp. 680, with illustrations. Price: not stated.

"Hormone: Einführung in ihre Chemie und Biologie", by O. Hanč; 1959. Jena: Veb Gustav Fischer Verlag. Sydney: Angus & Robertson, Limited. 9¼" x 6¼", pp. 644, with illustratons. Price: not stated.

"Praktische Blutlehre: Ein Ausbildungsbuch für prinzipelle Blutbildverwertung in der Praxis (Hämmogram-Methode)", by V. Schilling, 1959. Jena: Veb Gustav Fischer Verlag. Sydney: Angus & Robertson, Limited. 8" x 5¾", pp. 284, with illustrations. Price: not stated.

"A Textbook of Surgical Physiology", by R. Ainslie Jamieson, M.B., F.R.C.S.Ed., and Andrew W. Kay, M.D., Ch.M., F.R.C.S.Ed., F.R.F.P.S.G.; 1959. Edinburgh and London: E. & S. Livingstone Limited. 9¼" x 6", pp. 632, with 186 illustrations. Price: 55s.

"Official Year Book of Queensland, 1958", No. 19; 1959. Issued under Instructions from The Right Honorable the Treasurer, by S. R. Carver; compiled by S. E. Solomon. Brisbane: S. G. Reid, Government Printer. 8¼" x 5¼", pp. 464, with charts and illustrations. Price not stated.

"Diseases of the Nose, Throat and Ear: A Handbook for Students and Practitioners", by I. Simson Hall, M.B., Ch.B., F.R.C.P.E., F.R.C.S.E.; Seventh Edition; 1959. Edinburgh and London: E. & S. Livingstone, Limited. 7¼" x 4¼", pp. 480, with 85 illustrations and 8 coloured plates. Price: 21s.

"The Arterial Wall", edited by Albert I. Lansing, A.B., Ph.D., Sponsored by The Gerontological Society, Inc.; 1959. Baltimore: The Williams and Wilkins Company. 9" x 6", pp. 272, with many illustrations. Price: 82s. 6d.

"Le Sindromi Neuropsichiche de Carenza Alimentare", by Giuseppe Pintus, Alberto Muratorio and Aldo Giannini; 1959. Pisa: Omnia Medica. 9¾" x 6¾", pp. 290. Price: not stated.

"Office Orthopedics", by Lewis Cozen, M.D., F.A.C.S.; Third Edition; 1959. Philadelphia: Lea & Febiger. Sydney: Angus & Robertson, Limited. 9¼" x 5¼", pp. 432, with 321 illustrations. Price: £5 4s. 6d.

"Medical Management of the Menopause", by Minnie B. Goldberg, M.D.; 1959. New York and London: Grune and Stratton. 8¼" x 5¼", pp. 106, with illustrations. Price: $4.50.

"Current Medical Research: A Reprint of the Articles in the Report of the Medical Research Council for the Year 1957-1958"; 1959. London: Her Majesty's Stationery Office. 9¾" x 6", pp. 46, with illustrations. Price: 3s. 6d.

"A Handbook for Dissectors", by J. C. Boileau Grant, Fifth Edition; 1959. Baltimore: The Williams and Wilkins Company. 8" x 5¼", pp. 456, with illustrations. Price: $5.00.

"Handbook of Physiology: A Critical, Comprehensive Presentation of Physiological Knowledge and Concepts. Section 1: Neurophysiology", editor-in-chief: John Field; section editor: H. W. Magoun; executive editor: Victor E. Hall; Volume I; 1959. Washington: American Physiological Society. Baltimore: The Williams and Wilkins Company. 11" x 8½", pp. 794, with many illustrations. Price: £12 2s.

"The Actinomycetes: Volume I, Nature, Occurrence, and Activities", by Selman A. Waksman; 1959. Baltimore: The Williams and Wilkins Company. 10" x 6¼", pp. 340, with 107 illustrations. Price: £6 17s. 6d.

"The Artificial Feeding of Norman Infants", by William Emdin, M.D., D.P.H., Ph.D., B.A.; 1959. Cape Town: Howard Timmins. 8¼" x 5", pp. 128, with illustrations and tables. Price: 16s. (English).

"Diabetic Neuropathy: A Clinical and Histological Study on the Significance of Vascular Affections", by Sven-Erik Fagerberg; 1959. Acta Medica Scandinavica, Supplement 345. Stockholm: Acta Medical Scandinavica. 9½" x 7", pp. 100, with 27 illustrations. Price: not stated.

"Basic Bacteriology: Its Biological and Chemical Background", by Carl Lamanna, Ph.D., and M. Frank Mallette, Ph.D.; Second Edition; 1959. Baltimore: The Williams and Wilkins Company. 9" x 6", pp. 868, with many illustrations and tables. Price: £7 8s. 6d.

"Modern Surgery for Nurses", edited by F. Wilson Harlow, M.B., B.S., F.R.C.S.; Fourth Edition; 1959. London: William Heinemann Medical Books, Limited. 8¼" x 5¼", pp. 907, with illustrations. Price: 30s.

The Medical Journal of Australia

SATURDAY, JANUARY 9, 1960.

SIR CHARLES HASTINGS: FOUNDER OF THE BRITISH MEDICAL ASSOCIATION.

EVER since the days of Alfred the Great, the Anglo-Saxon character seems to have been developing qualities necessary to contend with the long succession of disturbing situations which make up much of English history. Our forebears came to be patient, adventurous and persevering, never willing to be turned aside from enterprises on which they were resolved, and extremely obstinate in their determination never to admit defeat. These traits of character may have accounted for Britain's rise to greatness in earlier centuries, and there is plain evidence of their persistence throughout the life and times of Sir Charles Hastings. In a lengthy biography of Hastings,[1] the illustrious founder of the British Medical Association, Dr. William H. McMenemey reveals that the same rare quality of endurance was possessed by those leaders of the profession who made the first positive contribution to achieving a united policy for medical reform.

Charles Hastings was the son of a Worcestershire clergyman and a medical graduate of the University of Edinburgh. After serving a term as president of Edinburgh's Royal Medical Society, he moved south to become an honorary physician to the Worcester Infirmary; and he happened to come upon the scene when the medical profession in Great Britain was in somewhat of a turmoil. Medical education was in a parlous state. Class distinctions, professional status and special privileges divided practitioners into a number of clearly defined strata. It was harvest time for the pure individualist, who fostered bitter antagonisms against his colleagues and freely vented his wrath upon the many unscrupulous rivals whose qualifications were doubtful or, in many cases, non-existent. Particularly in the country districts, struggling practitioners were obliged to submit to conditions of service under the Poor Laws which were nothing short of a public scandal; and in London the Royal Colleges were quite indifferent to the need for reform from within, and made no effort to find ways and means of improving the education, welfare and competence of the rank and file of general practitioners, who in actual fact were acting the part of family doctor to most of the ordinary people in the United Kingdom.

In 1832, Charles Hastings formed an association of qualified medical practitioners from Worcestershire and the neighbouring counties. Its objects were to create good fellowship among its members, to promote the ventilation and dissemination of new knowledge in the medical and allied sciences, to thrash out controversial matters connected with medical reform and to work for a radical improvement in the training and status of general practitioners throughout the whole country. Several men of outstanding ability and character threw in their lot with this phenomenal innovation to achieve medical unity through altruistic motives, the meetings in various centres were successful, and the influence of the Provincial Medical and Surgical Association began to spread far and wide.

A still earlier voice that was often heard crying in the wilderness was that of the irrepressible Dr. Thomas Wakley, the founder and first editor of that pioneer medical journal, *The Lancet*. From the beginning of its publication in 1823 he used his vitriolic pen in denunciation of the rigidly conservative attitude taken up by the Royal Colleges in refusing to alter their constitutions, and never hesitated to criticize severely the Worcester association or its upstart rival bodies whenever their views on medical reform did not coincide with his own. Later on he succeeded in being elected to Parliament so that additional impetus might be given to the movement by open discussion in the public forum.

The struggle to reach general agreement on the complicated issues involved in raising the standard of medical education and in providing a more adequate medical service for the people has been long and bitter, and we should remember that in it the British were pathfinders. They were the first to appreciate the inescapable fact that medical knowledge was in the process of change, that the old order was fast becoming obsolete and that their long-established medical institutions were no longer in step with the times. They realized that an unsatisfactory relationship existed between the different grades of doctors, and between the doctors and their patients. Finally, they insisted that the whole medical profession should be placed upon an organized and uniform basis, and should be given proper legal status in the community by a special Act of Parliament. At last, Sir Charles Hastings was able to speak for the profession of the United Kingdom when he announced that it had four main objectives in view: uniformity of qualification, equal rights of practice, the registration of practitioners, and the adoption of the representative principle in the governing bodies. After thirty years of bitter strife, frustrations, fruitless argu-

[1] "The Life and Times of Sir Charles Hastings: Founder of the British Medical Association", by William H. McMenemey, M.A., D.M., F.R.C.P., D.P.M.; 1959. Edinburgh and London: E. & S. Livingstone, Limited. 8¾" × 6", pp. 528, with illustrations. Price: 50s.

ments among themselves and ineffectual discussions with the politicians, with no safe haven in view and no precedent to guide them, the doctors, under the inspired leadership of Charles Hastings and with the steadying influence of the new British Medical Association, were granted a first glimpse of the promised land with the passing of a *Medical Act* which received the Royal Assent in August, 1858. Subsequent experience of legislative intervention proved the need for further amendments, but the original design was accepted, with the setting up of a General Medical Council of 24 members, consisting of representatives of the Crown and all branches of the medical profession, with power to exercise "a judicial function and a supervisory rôle in medical education".

That the battle-weary practitioners of Britain a century ago were not mistaken in their hopes for a better future, in which the application of scientific medicine would some day become esteemed by the people as a valuable national asset, is confirmed from the tenor of an address[1] delivered by Raymond B. Allen, President of the Second World Conference on Medical Education held by the World Medical Association in Chicago recently. He said:

> At the same time medical men have come to appreciate that there are many things which the State can do more effectively in certain aspects of preventive medicine, public health, and medical service. Governments everywhere are in the business of providing hospital services, for example, and this is as true in the United States as elsewhere. The great problems of the mentally ill, of infectious disease and tuberculosis, of mounting populations, and of food and nutrition, and medical services for the armed Forces and Veterans, require community and State action. Without this community contribution of facilities and services the individual physician and the profession as a whole could not render their most effective service. In a sense, the State, with the co-operation of physicians, deals with broad environmental problems and organizes facilities within which the profession can provide its independent and essential professional services. Accepted, too, is the fact that the State must exercise a licensing function of physicians and health service personnel. The State, together with the universities and medical schools, guarantees to the public that the medical graduate is qualified to practise medicine, assuming personal responsibility for the health of the individual.

We have good reason to cherish the memory of Sir Charles Hastings, as a man with an impelling sense of public duty, whose life was dedicated to his family, to his medical work and, above all, to the interests of his own profession. We can admire his integrity and singleness of purpose, his kindliness and unselfishness, and his thirst for knowledge in the spirit of a true scientist. We cannot help being impressed by the patience, tact and clever diplomacy he invariably displayed in his dealings with the parliamentarians, with the general public, with his rival medical associations and with recalcitrant members of the Provincial Medical and Surgical Association. The British Medical Association is his memorial. We can imagine also his hearty approval of such a body as the World Medical Association, which is constituted to correlate and disseminate new knowledge gained for medicine and its allied sciences, and to promote goodwill and fellowship among all members of the medical profession throughout the world.

> But tasks in hours of insight will'd
> Can be through hours of gloom fulfill'd.
>
> —MATTHEW ARNOLD.

[1] *Brit. med. J.*, 1959, 2: 319 (September 5).

Current Comment.

MAJOR INFECTIOUS DISEASES IN THE WORLD.

SMALLPOX was imported into 11 countries through international travel during the year ended June 30, 1959, and the disease occurred on board 11 ships and two aircraft engaged in international traffic. These are among the facts which were considered by the World Health Organization's Committee on International Quarantine, which met in Geneva from October 26 to 31, 1959, under the chairmanship of Dr. L. H. Murray, Principal Medical Officer at the Ministry of Health in London. The task of this committee is to review the functioning of the International Sanitary Regulations and their effect on international travel, and to make recommendations in these matters to governments through WHO.

Details of the outbreaks of smallpox due to international travel during the 12-month period ending June 30, 1959, are as follows. In Aden (Colony and Protectorate) there were 132 cases with 33 deaths; the infection was introduced overland from Yemen. In Ceylon there were 27 cases with two deaths on Leydon Island; the infection was probably introduced by boat from India. In Germany 18 cases occurred at Heidelberg and one at Kaiserslautern; the infection was introduced by a doctor returning from India by air via Colombo and Geneva to Zurich and by train from Zurich to Heidelberg. This last-mentioned epidemic points to the need to maintain vaccination practices even in countries from which smallpox is ordinarily absent. In Ghana there were three cases with one death. In Iran smallpox was imported at least three times by persons crossing into the country at unauthorized points. Malaya, Pakistan, Nigeria, the Philippines and the United Arab Republic also report imported cases. In the United Kingdom one case occurred in Liverpool, but no source of infection was determined. During 1958 a total of 247,000 cases of smallpox were reported, 88% of them in India and Pakistan. The annual average for the period 1952-1957 was less than 150,000 cases.

The year 1958 was also a bad year for cholera, with over 41,000 deaths reported. Three hundred cases of plague were notified in 1958, and 100 cases during the first nine months of 1959; this continues the downward trend noted in recent years. Notified cases of typhus show that the main focus of this disease is in Africa with sporadic cases occurring in Ecuador, Mexico, Korea and Yugoslavia. The incidence of yellow fever is down, with only six cases reported in the Americas and three in Africa during the first nine months of 1959. But the disease continues to slow up international travel because of the danger of its being imported into Asia, from which continent it has so far been absent. So far as it is known, there is nothing in nature except distance which prevents yellow fever from invading Asia. The two prongs of defence are vaccination and what is inelegantly described as "disinsectization"; as yet, no completely satisfactory method can be recommended for "disinsectizing" aircraft while in flight. The Committee heard a progress report on research into the use of DDVP for this purpose. DDVP is a comparatively new organophosphorus compound of very low or negligible toxicity to mammals which may prove to be the solution to the problem. The research is concerned with the possibilities of vapourizing this insecticide automatically in aircraft cabins through a time switch operated by the health authority at the airport of departure. If this method is proved safe, efficient and economically acceptable, it will of course take some time before it can be adopted on all aircraft. Performing this important health measure in flight is an advantage because it reduces delay on the ground.

The Committee discussed a report from the Government of Iran to the effect that arrivals who were not in possession of the required vaccination certificates have complained that they were not informed of such requirements. In relation to this the Committee's view is that

whoever sells the traveller the ticket should make it his business to inform him of health requirements, that consulates can help in this matter and that in general more publicity should be given to health regulations relating to travel. The Committee does not consider that persons who lack the necessary vaccination certificates should be prevented from travelling, even though they may then be delayed on arrival. It appears that before issuing a ticket some air companies even require travellers to have vaccination certificates not required by the country of arrival; certificates against typhoid, paratyphoid, and poliomyelitis have been demanded. The Committee stresses that, under the International Sanitary Regulations, certificates of vaccination against only smallpox, cholera and yellow fever may in certain circumstances be demanded.

THE HEALTH OF MOTHERS AND CHILDREN.

OVER 21,000 centres for mothers and children throughout the world receive assistance from the United Nations Children's Fund and the World Health Organization, the work and health policies of which were reviewed at a joint meeting held in Geneva early in December, 1959. In the Eastern Mediterranean region, the main health problems in children with which the centres have to deal are malnutrition, diarrhœal diseases, respiratory and eye diseases. In Africa malnutrition, particularly kwashiorkor, and malaria are very commonly seen. In the Americas the most common causes of disease and death in children are diarrhœa and respiratory infections, with nutritional disease as a probable third.

These and other facts emerge from a detailed study by WHO of selected mother and child health centres in all parts of the world. In countries with food shortage the child who no longer obtains his food regularly through breast feeding is especially vulnerable. How long is breast feeding continued? In many tropical and subtropical countries babies are usually breast fed up to two years of age and even longer; solid foods, but not always the right ones, are given during the first year. The UNICEF/WHO Joint Committee on Health Policy urged that health centres should do more for children during the weaning period. One way of helping here is to teach mothers to make the best use of food, and nutrition education is widely practised by the health centres. The UNICEF/WHO Committee was not uncritical of these efforts. There are centres where posters illustrate a nicely balanced diet, but with foods that are not locally available or are too expensive—meat, eggs, vegetables. Again, teaching about proteins, vitamins and carbohydrates may mean something to the nutritionist but not to the housewife. It takes time and effort to change old habits. In India, for example, a number of recent investigations tend to show that some educational efforts have so far had insufficient effect on ancient feeding practices. In Burma, also, to mention one country among many, boiled polished rice is not yet discarded, despite emphasis in favour of more nutritive forms. In Afghanistan, however, the mere fact of distributing milk has had a revolutionary effect. When mothers got accustomed to receiving and giving milk, they developed an understanding for its usefulness, and women can today be seen buying milk in the market for their children, a rare sight only a few years ago. The conclusion of the Committee on Health Policy is that the training of all personnel in the field of nutrition needs to be improved, and that practical teaching on the use of available foods and their preparation in the centres should be carefully adapted to local needs.

Vaccination against smallpox is very widely carried out by the mother and child health centres, but the Committee has urged that the immunization programme of the centres should be extended to other diseases also, and that UNICEF should intensify its assistance in this matter. In South America, approximately 80% of the centres (90% in Peru) systematically give smallpox vaccination as well as immunization against diphtheria and whooping cough. Injections against tetanus are also widely given, whereas only 30% of centres give BCG against tuberculosis, and only 25% give typhoid immunization. Many centres list vaccines among the supplies they would like to obtain through international aid. In South-East Asia, smallpox vaccination is done by 80% of the centres. Only 10% of the centres have reported carrying out a programme of immunization of children against diphtheria, whooping cough and tetanus. BCG, typhoid and cholera vaccinations are given sporadically. As yet, immunization campaigns against poliomyelitis are not general policy. In other regions the situation is not very different, and the conclusion that more vaccinations are needed is inescapable.

The Committee has laid great stress on the need for greater numbers of health personnel and for improved training. Pædiatric training should be strengthened at all levels. The health worker most frequently found in mother and child centres is the midwife, and the Committee recommends that her training should be broadened so as to enable her to take care of children up to school age. Another solution would be the creation of a new type of worker to meet child health problems that are now to some extent neglected.

Emphasis is laid by the Committee on the fact that child health services cannot be considered in isolation of other health services, but should be integrated with them. On the over-all policy question of international assistance to mother and child health services, the Committee urges that support should not only continue but be intensified as far as possible. The Committee has also reviewed the present UNICEF/WHO programme in the field of environmental sanitation and laid down the lines for increased UNICEF activities in this sphere. The emphasis is placed on better water supply and sewage disposal for the control of diseases that affect children, on improved sanitation in schools, health centres and community centres, and on the training of sanitation personnel.

AUTHORS' QUALIFICATIONS.

SOME difference of opinion exists on whether or not the author of an article in a medical journal should state his academic qualifications and appointments, but the more usual practice today is to do so. In a small community, where the leading practitioners, research workers and teachers are known, at least by name, by most of their colleagues, their status does not need to be established; but when authors are not known widely outside their immediate circle of associates, it is important that others should have some means of knowing who they are, especially as the scientific standards of medicine rise.

For many years the policy of this Journal has been to leave the matter largely to the author, with a slight bias towards omitting the type of detail mentioned. Now, however, it has been decided to ask authors to include their relevant qualifications and appointments and, where appropriate, the centre from which the work comes. It is not intended that the detail should be exhaustive—quite the contrary; and we think that it can be left to the common sense of authors to recognize, for example, that for those with a considerable number of senior degrees and diplomas, or multiple appointments, a judicious and relevant selection is better than a small *curriculum vitæ*.

When authors do not supply the desired information, the practice that we shall adopt, at least until the idea becomes established, will be to add details that seem to us appropriate from "The Medical Directory of Australia". Authors will have the opportunity to check and, if necessary, modify these when they receive their proofs for final correction.

Abstracts from Medical Literature.

MEDICINE.

The Prognosis in Essential Hypertension.

H. S. MATHISEN *et alii* (*Amer. Heart J.*, March, 1959) reexamined 290 patients with essential hypertension who had previously been reported on by Mathisen in 1951. The patients, when first seen prior to 1944, were all under the age of 46 years and then had a blood pressure of 160/95 mm. of mercury or more. Patients with renal and other forms of secondary hypertension were excluded and so were those with hypertensive complications at the beginning of the study. Of the total 62% were females and 38% males. At present the average follow-up period is 16 years and all but five patients have been traced. The over-all mortality was 42% in females and 58% in males. Whilst in the 1951 examination 17 cases of malignant hypertension had been discovered, at the present follow-up examination no new cases of malignant hypertension were discovered. Unlike several other investigators, the authors found that the commonest cause of death was cerebrovascular accident. Fifty-five *per centum* of all deaths was due to this cause, 24% to cardiac complications, 12% to renal lesions and 9% to miscellaneous causes. Cerebrovascular accidents were more common in females, cardiac and renal deaths were more common in males. The authors confirm that the prognosis appears to be better in females. Labile hypertension, with diastolic blood pressures falling to below 95 mm. of mercury with rest and sedation, denoted a definitely better prognosis.

Heart Failure in Patients with High Blood Pressure.

J. N. MICKERSON (*Brit. Heart J.*, April, 1959) states that although hypertension may increase greatly the work of the heart, the heart does not fail unless some additional embarrassment is imposed. In a series of 341 patients a cause of failure in addition to hypertension was found in all but 10. Ischæmic heart disease precipitated heart failure in half the patients, and in a further 14% it probably contributed to the development of failure. Other important causes of heart failure were valvular heart disease, renal disease, alone or combined with cardiac lesions, malignant hypertension and respiratory infections. Hypotensive drugs have, by reducing the work load of the heart, increased the relative importance of these additional factors.

Hæmorrhagic Pericardial Effusion following Myocardial Infarction.

J. C. GREENFIELD AND M. L. DILLON (*Amer. Heart J.*, March, 1959) report the case of a male patient aged 50 years who, four weeks after a typical myocardial infarction, developed a recurrent hæmorrhagic pericardial effusion which required several aspirations. Skiagrams after air replacement revealed the presence of a large ventricular aneurysm which was subsequently removed surgically, with the disappearance of effusion. Three months later a recurrence of the localized swelling of the heart shadow was noted due to a rapidly expanding recurrent ventricular aneurysm. The patient died during an attempt to repair the aneurysm a second time with the aid of extra-corporeal circulation.

Pericarditis Complicating Myocardial Infarction after Steroid Therapy.

W. DRESSLER (*Amer. Heart J.*, April, 1959) has previously drawn attention to the post-myocardial infarction syndrome consisting of pericarditis, pleurisy and pneumonitis. This has a characteristic tendency to recurrences resembling the post-commissurotomy syndrome. Both conditions are dramatically relieved by corticosteroids. Withdrawal of hormones may be followed by a mild rebound; occasionally the flare-up is severe and may occur after months or even years of steroid therapy. The author describes one such case where repeated attempts to withdraw the hormones resulted in a relapse of fever and chest pain. In this case steroid therapy was continued for more than two years, on two occasions, ten months and two years after institution of steroid therapy, withdrawal of hormones was followed by development of pericarditis with effusion, pleurisy and pneumonitis.

Prognosis After Mitral Valvuloplasty.

L. B. ELLIS, D. E. HARKEN AND H. BLACK (*Circulation*, June, 1959) present a clinical follow-up study of 1000 consecutive patients operated on for mitral stenosis between 1949 and 1956. Seven-year survival figures, including operative mortality, are much higher than those of a medically treated group. The authors state that, apart from many other benefits conferred by the operation, there is substantial protection against peripheral embolization. Patients with pre-operative tight mitral stenosis did better than those whose stenosis was less severe. The presence of associated aortic valve disease of mild degree did not affect the ultimate outcome. During the follow-up period some deterioration was noted in 25% of patients. Factors responsible for this included: (i) recurrent rheumatic fever; (ii) presence of mitral insufficiency; (iii) inadequate or unsatisfactory operation; (iv) myocardial fibrosis; (v) restenosis, an uncommon but apparently well documented complication.

Acquired Resistance to Injury.

L. KOSLOWSKI (*German Medical Monthly*, May, 1959) resurrects the speculations of Metschnikoff about the possibility of immunizing reactions to absorption of the body's own cells, and he reviews subsequent attempts to produce active immunization against burns and traumatic shock. He describes experiments upon animals which had recovered from experimental trauma and were then found to suffer less severe disturbance and to recover more rapidly after a second identical injury. This apparently heightened resistance to injury was found to correspond with altered reactivity in many fields of bodily function. For instance the changes produced by trauma in the albumin and globulin of the plasma were more pronounced and prolonged after the second injury; the leucopenia with lymphocytosis which followed a single injury was replaced by a leucocytosis; the release of H-substance was accelerated, and its removal also; the fall in blood pressure was less; the water content of the suprarenal glands was greater (showing enhanced activity), but in other organs œdema was less and of shorter duration. Auto-antibody formation was demonstrated by flocculation with rat-muscle antigen and the sera of traumatized rats; but the author suggests that the results obtained need confirmation by more refined methods. However, the results open the door to the possibility of obtaining, concentrating and preserving protective substances derived from animals with a view to their use in the treatment of severe autolytic diseases, such as burns and acute pancreatic necrosis.

Use of a Calcium Chelating Agent in Cardiac Arrhythmias.

B. D. COHEN *et alii* (*Circulation*, June, 1959) report on the use of a calcium chelating agent, disodium ethylene diamine tetra acetate ("NaEDTA") in the treatment of 14 patients with cardiac arrhythmias. They point out that calcium and digitalis act synergistically on myocardial contractility and irritability. "NaEDTA" diluted with 5% glucose to a concentration of 20 mg. per ml., and given intravenously at the rate of 100 to 500 mg. per minute, proved therapeutically successful in five cases of ventricular tachycardia resulting from over-treatment with digitalis. Supraventricular arrhythmias did not respond to this form of therapy.

The Radiological Features of Syphilitic Aortic Incompetence.

W. G. SMITH AND J. C. LEONARD (*Brit. Heart J.*, April, 1959) discuss the radiological features of syphilitic aortic incompetence. They examined chest skiagrams of 83 patients with this condition and found that linear calcification of the ascending aorta was an almost specific radiological sign of syphilitic aortitis. An over-penetrated postero-anterior skiagram with a stationary grid was most valuable to show calcification in the ascending aorta. Occasionally oblique views and tomograms were necessary. This sign was of particular value in determining the ætiology of aortic incompetence, and is not found in rheumatic aortic valve lesions.

Simple Goitre due to Increased Iodine Excretion.

C. CASSANO, L. BASCHIERI AND D. ANDREANI (*Presse méd.*, March 28, 1959) describe a type of goitre without hyperthyroidism or hypothyroidism, probably associated with an excessive urinary excretion of iodine. The patients have an elevated halogen renal clearance. Investigating the causes of this iodine loss, the authors have found that hyperfunction of the pituitary and of the adrenal cortex appears to play a part. On the other hand, excretion of iodine by the kidneys seems to be related to the

sodium chloride balance. Further investigations are in progress.

Nephrocalcinosis.

R. FONTAINE, R. KIENY AND E. WEILL (*Presse méd.*, February 21, 1959) report a case of nephrocalcinosis without lesions of bone, due to a parathyroid adenoma within the thymus. The patient was a woman, aged 40 years, who suffered from bilateral renal colic, and was found to have diffuse areas of calcification in both kidneys, without lesions in the urinary tract. Investigations revealed marked renal insufficiency, but no lesions in the skeleton. The biochemical changes were slight, but characteristic. The tumour was successfully removed. The authors discuss primary hyperparathyroidism occurring in the form of nephrocalcinosis alone.

Pulmonary Histoplasmosis in Africa.

A.-P. JARNIOU *et alii* (*Presse méd.*, April 22, 1959) report a case of pulmonary histoplasmosis, the infection having been acquired in French West Africa. They state that this case further extends the known geographical range of histoplasmosis. It also underlines the difficulty of diagnosis in this condition, because for a year radiological signs alone were obtainable, and the disease process could not be identified until finally bronchopulmonary suppuration of a peculiar type occurred.

Cardiac Lesions Produced by Excess of Nor-Adrenaline.

G.-G. NAHAS *et alii* (*Presse méd.*, May 27, 1959) have studied the effect of an excess of nor-adrenaline in the production of cardiac lesions. They state that the presence in the body of too much adrenaline or nor-adrenaline, whether of endogenous (from a phæochromocytoma) or exogenous origin, may produce severe cardiac damage, particularly myocardial hæmorrhage and valvular œdema. These lesions can be reproduced experimentally in the intact animal and in the heart-lung preparation. The mechanical factor of arterial hypertension is not sufficient of itself to explain the probably complex pathogenesis of these cardiac changes, knowledge of which makes it necessary to exercise caution in the therapeutic use of nor-adrenaline. This is particularly so when corticoids are also being given, and when the myocardium is already damaged.

Malignant Œdematous Exophthalmia as a Sign of Leukæmia.

H. GRIGOIRE *et alii* (*Presse méd.*, April 22, 1959) report the case of a man, aged 18 years, who presented with severe bilateral œdematous exophthalmia, and no other abnormality on clinical examination. He was admitted to hospital for investigation, and all tests gave completely normal results until a routine blood examination revealed the presence of leukæmia. The patient died six months later, having failed to respond to treatment, and a post-mortem examination was performed. The authors state that the present case provides anatomical confirmation of the hypothesis that malignant œdematous exophthalmia may be of pituitary origin. At the same time, it brings forward two new points for consideration: (i) the possibility that the pituitary may secrete a pure exophthalmia-producing hormone, quite distinct from thyroid-stimulating hormone; (ii) the place of leukæmia among other causes in producing malignant œdematous exophthalmia by means of pituitary infiltration.

Idiopathic Hypoproteinæmia.

M. BARIÉTY AND A. GAJDOS (*Presse méd.*, May 16, 1959) report a case of idiopathic hypoproteinæmia with generalized œdema and severe ascites. The diagnosis was made specially difficult by the coexistence of incipient hepatic cirrhosis. The persistence of pronounced and almost invariable hypoproteinæmia after the disappearance of the ascites, the presence of œdema, eosinophilia, hypocalcæmia and gastric achlorhydria, the absence of any renal or cardiac signs, and finally the accelerated catabolism of serum albumin, studied by the isotopic method, made possible the firm diagnosis of the disease. The authors give a detailed description of the clinical and biological picture of the illness, on the basis of their own case and the 50 or so reported in the literature.

The Electrocardiogram in Acute Carbon Monoxide Poisoning.

G. FAIVRE, J.-M. GILGENKRANTZ AND J.-M. HUEBER (*Presse méd.*, March 14, 1959) have studied the electrocardiographic changes in acute carbon monoxide intoxication. There were 40 cases in the series. They present the following conclusions: (i) An electrocardiographic examination should be carried out as a matter of course, in the same way as the carboxyhæmoglobin content of the patient's blood is always estimated. It alone can reveal the most usually encountered changes that do not produce clinical signs. (ii) Disturbances of the repolarization phase are frequent, and produce similar changes, ranging from ischæmia and infarction to ordinary atheromatous coronary insufficiency. (iii) The condition preceding the poisoning, which influences the appearance and duration of the electrocardiographic changes, is of medico-legal and diagnostic importance. In 24 of the 40 cases there were no changes in the electrocardiogram. Six cases in which various disturbances were noted had to be eliminated, because the patients could not be adequately followed up. In 10 cases there were changes undeniably brought about by the poisoning, either because the condition existing before the coma was known, or because the disturbances disappeared at the end of a few days or months. The most important changes were tracings indicative of ischæmia and of myocardial infarction with necrosis. The authors stress the usual reversibility of the lesions, and discuss their pathogenesis.

An Epidemic of Pleurisy with Effusion in Turkey.

FAHRETTIN ALPTEKIN (*Presse méd.*, April 25, 1959) presents a report of an epidemic of an acute febrile illness, characterized by basal pleurisy with effusion and running a benign course, which occurred at Bitlis, Turkey, in 1955. Altogether, 559 cases were recorded. The condition was quite different from all other types of pleurisy and acute respiratory disorders. The difference lay in the occurrence in all cases of basal pleurisy with effusion, and in the peculiar characteristics of the pleural fluid, monocytes being the predominating cells found in it. Convalescence was long drawn out; few of the patients were able to return to work until three or four months after the onset of the illness. The incidence was highest towards the end of winter and in the spring, and lowest in summer. It spread most rapidly in overcrowded barracks, the infecting agents being apparently air-borne. The author considers it probable that the disease, which he has called "epidemic pleurisy", is caused by a virus.

Fahr's Disease: An Unusual Case.

E. BERNARD-WEIL AND R. PERELMAN (*Presse méd.*, April 22, 1959) report a case of Fahr's disease with unusual manifestations. The patient, a man, aged 33 years, presented with calcification of the central basal ganglia, generalized epileptiform convulsions, bilateral cataract, deafness and transitory Chvosteck's sign. The authors give their reasons for considering that the primary cause was a hypothalamic lesion. They base this hypothesis on a careful analysis of the signs of parathyroid disturbance, and also on the considerations raised by the patient's testicular insufficiency. They state that this is the first reported case of Fahr's disease associated with hypergonadotrophic hypogonadism.

Staphylococcal Bacteriæmia and Endocarditis.

R. H. MEADE (*Circulation*, March, 1959) reviews the question of staphylococcal bacteriæmia and endocarditis. Amongst many important facts he points out that the nose and throat of about 65% of the normal population contain staphylococci of varying pathogenicity. In hospital workers the carrier rate is probably about 90%. Prior to 1940 the underlying cause of staphylococcal bacteriæmia in nearly 20% of all cases was osteomyelitis. Currently this has dropped to only 2·4%. Nowadays pneumonia is an important cause of staphylococcal bacteriæmia. Clinically, patients can be grouped in five categories on the basis of their major symptoms: (i) symptoms are due to the primary infection; (ii) symptoms are due entirely to bacteriæmia; (iii) symptoms are due to the metastatic suppurative lesions; (iv) symptoms are due to a combination of the three; (v) all symptoms are masked by a coexisting disease or suppressed by therapy. Penicillin remains the drug of first choice for management of infections developed outside the hospital in the absence of specific knowledge of the organism sensitivity. The dose advocated varies from four to 20 million units a day, either alone or preferably combined with one more drugs such as streptomycin. For hospital-acquired infections, chloramphenicol and erythromycin are advocated, in doses of 50 to 75 mg. per kilogram. In severe infections thes two antibiotics should be given parenterally to ensure adequate tissue concentrations. Among the more recently developed antibiotics with good anti-staphylococcal properties are novobiocin, vancomycin, kanomycin and ristocetin.

Brush Up Your Medicine.

THE SURGICAL TREATMENT OF PARKINSON'S DISEASE.

THE scope of neurosurgery has widened almost dramatically in the past fifteen years, and fields in which good prospects of helpful treatment can be offered have expanded considerably. The most recent addition to this category is the surgical treatment of disabling involuntary movements, of which Parkinson's disease (paralysis agitans) is by far the commonest example. Strictly speaking, surgical attempts to relieve rigidity and tremor are not by any means new. Much ingenuity has been employed and considerable operative skill displayed over the years. Nevertheless, results were frequently unrewarding, and though some sufferers gained limited improvement, no method was universally accepted by surgeons or recommended freely to their patients.

The scene has changed as a result, as it were, of an operating accident, when a surgeon, during his approach to perform a pedunculotomy for Parkinson's disease, tore the anterior choroidal artery (Cooper). Having arrested the hæmorrhage, he abandoned the operation, as the outcome of this accident was unknown; but the patient recovered with his disabilities greatly relieved. This led to the exploration of the possibilities of dividing the anterior choroidal artery as a definitive procedure. Its branches supply the globus pallidus and, to a varying extent, part of the internal capsule and medial inferior thalamic nuclei (Abble). The operation was undertaken with some most gratifying results, but it carried with it an appreciable risk of hemiplegia or death, particularly in some of the older patients with an advanced degenerative type of disease. The effect of this arterial occlusion was to destroy the cells in its area of supply, and in view of its risks, alternative methods of causing pallidal destruction were sought, thus leading up to the development of the procedure known as chemopallidectomy. The principle here is to place a fine plastic cannula down to the nucleus and, by the injection of alcohol, to destroy its cells. This technique, with modifications, has been widely accepted, and Cooper and his co-workers have an extensive experience of the method, preferring it to other procedures employed in different centres (*vide infra*). Their only major change has been to destroy the lateral ventral thalamic nucleus in preference to the globus pallidus, because they found it gave more reliable relief of rigidity and tremor. Other variations made in their technique involved the production of pressure necrosis at the tip of the cannula by the inflation of a small plastic balloon. This is left *in situ* for two or three days, after which alcohol is injected into the dead space produced. Also, as alcohol is readily diffusible, they tried to modify this by making a thicker solution containing celloidin, whilst other workers have employed a mixture containing kaolin (McCaul).

Surgeons in other centres and other countries followed suit; but some were unhappy about injecting a diffusible chemical into an area not far distant from the internal capsule and the hypothalamus. The outcome was the use of electrodes, placed in the same site as advocated for chemopallidectomy or chemothalamectomy, through which a coagulating current can be passed to destroy the appropriate cells. However, just as one cannot visualize exactly where alcohol will diffuse, so one cannot forecast exactly what area of necrosis may be produced by thermocoagulation, or how large will be the surrounding area of œdema in which thrombotic processes may be initiated. Nevertheless, with short bursts of diathermy measured on a milliammeter and with careful neurological observations between bursts, a check can be kept perhaps better than during the injection of an alcohol solution.

The operative procedures are quite simple, though distinctly time-consuming and demanding meticulous care; but it must never be overlooked that the results of what one does may be far-reaching, and calculated risks must be taken (*vide infra*). Certain factors are common to all techniques: a large burr-hole in the region of the coronal suture must be made, and an air encephalogram carried out in which certain structures must be identified (usually the lateral ventricles, the foramen of Monro and either the pineal gland or the posterior commissure). Once these have been found, the position of the globus pallidus or the various thalamic nuclei can be estimated and marked on the film. From this point on, the technique depends on the method chosen, for the advent of this type of surgery has stimulated the ingenuity of all with an inventive turn of mind, so that many and varied are the instruments advocated. The introduction of the Cooper cannula was originally effected by attaching to the patient's head a light frame, on which is mounted a holder for the cannula adjustable in two planes. The cannula was then aimed at a bony point and passed into the brain through the burr-hole, its direction being checked by X-ray films taken in the lateral and antero-posterior planes. If it was not approaching the point marked on the air encephalogram, it was withdrawn and reinserted in the proper direction. Once having been placed correctly, the cannula is sutured to the scalp, and the small plastic balloon of about 1 ml. capacity is filled with radio-opaque fluid and its position is again checked radiologically. If it is correctly placed, on inflation there should occur a demonstrable reduction of rigidity and tremor, perhaps even complete abolition, without any loss of power. After two or three days the balloon is deflated, and small quantities of alcohol mixture are injected before the cannula is finally removed. Today the original rather crude carrier has been replaced by various inventions making introduction far more accurate and not subject to trial and error. A description of all would be inappropriate in a paper of this nature.

Stereotaxic apparatus is applicable to this procedure, and is used particularly for the introduction of electrodes. Very high degrees of accuracy are claimed for stereotaxic methods and indeed justly so; but when one is making a big lesion, as in Parkinson's disease, great accuracy is not necessary. Again, there are many types of apparatus available and each variety has its adherents. A vital factor in their use is painstaking radiography, so that exact centring and alignment of the beam are achieved; then, and only then, can accurate measurements be made on the various scales of the instrument against the air-filled ventricles. A number of estimations must be made, after which the electrode, which is insulated except for its terminal few millimetres, can be inserted into the nucleus to be destroyed. Once coagulation has been started, it should be possible to demonstrate progressive reduction of both tremor and rigidity.

One of the main difficulties with the electrodes is a technical one—the insulation is unreliable and may fail to prevent the escape of the current. The result is that coagulation will occur, not only at the uninsulated tip of the electrode, but also anywhere along its length where insulation happens to be defective.

A comparison of the two methods—chemical coagulation and electrocoagulation—is difficult. Excellent results have been produced with both, and in fact both methods are in use at various units, with the object of making a comparison when a sufficiently large series of patients has been dealt with. In general terms, one would say in favour of the stereotaxic apparatus that its various attachments make all operations approach a standard, so that one may make a true comparison over a large series and perhaps make possible a better localization of function. If this can be done, smaller destructive lesions may be anticipated, and consequently the greater accuracy in placement of the electrode will become far more important than it is now. Against it one must invoke the unreliability of insulation, and the impossibility of knowing just how large a lesion one is producing by coagulation, to which must be added an unknown zone of surrounding œdema. In fact, coagulation has been abandoned in some clinics (McCaul).

In favour of the chemical method, it should be pointed out that the insertion of the cannula is simpler and quicker; also one must consider its continued success in the only large series of cases recorded (Cooper). Against this, in the same series, one must weigh a 2·4% mortality and 3% hemiplegia rate. Also against it is the lack of any exact standard of alignment of the X-ray films, so that a series of cases is not truly comparable. Finally, the diffusibility of alcohol is a drawback which has hitherto been partially overcome by injecting it in more viscid mixtures; but, as in coagulation, one has no firm control over the extent of necrosis produced. Suffice it to say that both methods give excellent results, and as time and experience lengthen, refinements of technique will undoubtedly develop, with benefit to future patients.

Some other questions demand an answer before this work is undertaken. What benefit can the patient expect from operation? What are the risks involved? And what is the method of selection of patients for operation?

The last question may be considered first. It is reasonable to consider surgery for those patients whose disability is not

relieved by properly supervised medical treatment. The most favourable patient upon whom to operate is the young post-encephalitic subject with unilateral Parkinson's disease; at the other end of the scale is the patient of advancing years with long-standing disease of degenerative or arteriosclerotic origin. Once the age of 60 years has been passed, one must be very careful in assessment. It is important to judge the physiological age; there are many robust people of 65 or 70 years upon whom one would readily operate, whilst rejecting a feeble subject of 60 years. Important additional factors are the cardiovascular state and particularly the chest. In the disabled, rigid patient with long-standing disease, the thoracic cage may be particularly immobile; this may lead to complications after operation, especially if the patient goes into a lethargic, vegetative state for a few days.

The benefit that a patient may expect from a successful operation is a great lessening or even abolition of the rigidity and tremor in the limbs, with resulting improvement of function. For example, the helpless patient confined to a chair who has to be dressed and fed, may well improve so that he can feed and dress himself, and perhaps may even walk a little. On the other hand, the patient who is mobile and independent, but cannot work owing to a severe tremor in his arm, may well return to work. Thus, improvement is a matter of degree only—no patient should be allowed to think that he will be made 100% normal again. This, unfortunately, is the impression that some patients have gained from lay Press reports. Moreover, those with speech and swallowing defects or oculogyric crises should not anticipate much change in those particular symptoms—they should never lose sight of the fact that almost the entire benefit will be obtained through relief of tremor and rigidity in the limbs; but one is quite justified in saying that there may be unpredicted and welcome changes of some degree in certain symptoms not involving the limbs.

There are risks involved in this type of surgery, and complications are inclined to occur some hours or even days after operation, so that, though a patient may be very well in all respects at the conclusion of an operation, one remains apprehensive for some days afterwards. Occasionally hemiparesis may be apparent during operation, and also deterioration of consciousness, but these may be delayed phenomena. Both may recover completely and usually do so; but there is a small proportion of patients in whom a neurological defect persists or some mental change occurs. These must be calculated risks, and the proportion is fortunately small. Death may follow intercurrent pulmonary infections or coronary episodes. There is also a post-operative state known as "akinetic mutism", in which the patient is conscious and rousable, but will not make an effort of any sort and is incontinent of urine and fæces. These patients have to be fed by tube, and their nursing presents a considerable problem. This state, in some degree, is not uncommon and usually is transient only. Occasionally, however, it persists for a longer period, and in the older, feebler type of patient with a rigid chest wall it is easy to see that pneumonia may end the story.

It must not be thought that these risks are great—they are not, particularly in carefully selected patients. It is emphasized that this type of surgery offers benefit to many. It is widely accepted as a great advance in the treatment of a crippling disability, and has been extensively employed in this country over the past two years with many gratifying results.

Department of Neurosurgery, J. L. DOWLING.
St. Vincent's Hospital,
Sydney.

Bibliography.

ABBIE, A. A. (1933), "The Blood Supply of the Lateral Geniculate Body; with a Note on the Morphology of the Choroidal Arteries", *J. Anat.*, 67: 491.

ABBIE, A. A. (1944), "The Morphology of the Forebrain Arteries; with Especial Reference to the Evaluation of the Basal Ganglia", *J. Anat.*, 68: 433.

AUSTIN, G., and LEE, A. (1958), "A Plastic Ball-and-Socket Type of Stereotaxic Director", *J. Neurosurg.*, 15: 264.

BERTRAND, C. M. (1958), "A Pneumotaxic Technique for Producing Localised Cerebral Lesions", *J. Neurosurg.*, 15: 251.

COOPER, I. S. (1954), "Surgical Occlusion of the Anterior Choroidal Artery in Parkinsonism", *Surg. Gynec. Obstet.*, 99: 207.

COOPER, I. S. (1954), "Surgical Alleviation of Parkinsonism: Effects of Occlusion of the Anterior Choroidal Artery", *J. Amer. Geriat. Soc.*, 2: 691.

COOPER, I. S. (1954), "Chemopallidectomy and Chemothalamectomy for Parkinsonism and Dystonia", *Proc. roy. Soc. Med.*, 52: 47.

COOPER, I. S., and MARELLO, A. (1956), "Surgical Alleviation of Parkinsonism", *J. Amer. med. Ass.*, 160: 1444.

COOPER, I. S., and POLONKLINE, N. (1955), "Chemopallidectomy: A Neurosurgical Technique Useful in Geriatric Parkinsonism", *J. Amer. Geriat. Soc.*, 3: 839.

MCCAUL, I. R. (1959), "A Method for the Localization and Production of Discrete Destructive Lesions in the Brain", *J. Neurol. Neurosurg. Psychiat.*, 22: 109.

British Medical Association.

NEW SOUTH WALES BRANCH: SCIENTIFIC.

A MEETING of the New South Branch of the British Medical Association was held on September 25, 1958, at Sydney Hospital. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff of the hospital.

Marfan's Syndrome.

DR. F. H. READ and DR. C. J. M. KING showed a married man, aged 36 years, who was employed as a machinist. His presenting symptoms were intermittent claudication and night cramps almost every night, and dyspnœa on exertion. Both symptoms had started about February, 1958, and were progressive. Other symptoms included tiredness, early morning frontal headaches, nocturia, great thirst, and some visual impairment in the preceding 18 months. He had a past history of an operation for right inguinal hernia in December, 1957; otherwise there was nothing relevant. His father, aged 70 years, was alive and suffered from hypertension. His mother, aged 69 years, was alive and had hypertension also. The patient's two brothers were alive and well. One uncle had died suddenly, aged 52 years, possibly from a coronary occlusion. The patient had two children: a son, aged 13 years, who had bilateral dislocation of the lens, a high arched palate and present femoral pulses; and a daughter, aged five years who had bilateral dislocation of the lens, a high arched palate and present femoral pulses.

On examination, the patient was a tall, stout man with evidence of recent weight loss. His blood pressure was 270/180 millimetres of mercury. The radial vessels were tortuous and thickened. His pulse rate was 80 per minute and was regular. The apex beat was in the fifth left intercostal space, five inches from the mid-line, and an apical triple rhythm was present. Femoral and peripheral pulses were present. The pupils were eccentric, equal and active; the lens showed bilateral subluxation. An electrocardiographic examination revealed a pattern of left ventricular strain of marked degree. An X-ray examination of the chest showed that the heart was enlarged in the transverse diameter, and there were congestive changes in the lung fields. An intravenous pyelogram showed that the renal outlines were normal, both kidneys were functioning well, no definite abnormality could be seen in the collecting systems, and there was no evidence of calculus. The blood urea nitrogen content was 18 milligrammes per 100 millilitres; the creatinine content was 1·6 milligrammes per 100 millilitres. A microscopic examination of the urine revealed occasional epithelial cells, up to three erythrocytes and up to two leucocytes. Occasional hyaline and granulo-hyaline casts and a moderate number of amorphous urate crystals were present. A glucose tolerance test gave a normal result.

Mediastinal Shadows.

The staff of the Pulmonary Clinic showed skiagrams of mediastinal shadows, which were supplemented by autopsy specimens. It was emphasized that extensive investigation was required in those cases to determine the underlying pathology and to define the treatment. However, as was illustrated by the cases presented, the ultimate diagnosis often remained in doubt prior to surgical exploration. It was emphasized that a conservative policy of protracted observation was not justified in view of the high probability of malignant disease.

Chordoma.

MR. A. P. FINDLAY first showed a male pensioner, aged 78 years, who had a lump in the natal cleft. He had first noticed the lump three years earlier, after he had fallen in the bath. The lump gradually grew, and became more painful until it discharged a small amount of fluid in June, 1958. When the patient was examined, the lump measured about one inch by half an inch; it was cystic,

smooth and tender, and was attached to the deeper tissues in the natal cleft. Mr. Findlay excised the lump on June 5, 1958, and at operation it was found to measure two inches by two inches, and was completely replacing the coccyx. The specimen was a firm, ovoid new growth, measuring 8 by 6 by 5·5 centimetres, with an attached piece of elliptical skin. The skin was normal and freely mobile over the growth, which was deep to the subcutaneous tissues and superficial fascia. The external surface was mainly ragged, and on one side small, thin flakes of bone were attached. In a small area a fibrous capsule was closely adherent to the new growth. There was also a well-defined yellow gelatinous area. A diagnosis of chordoma was made on the histological finding. In view of the patient's age, deep X-ray therapy was not considered necessary.

Multiple Carcinomata.

Mr. Findlay then showed a female patient, aged 63 years, who had had carcinoma, involving first the breast and then the colon, over a period of seven years. She had first attended at the skin department in November, 1951, complaining of scabbing of the right nipple for about nine months with occasional bleeding. Mr. Findlay had excised the nipple in November, 1951. The biopsy report read: "The nipple ulcer is due to carcinoma which is present within the ducts of the nipple and has infiltrated the connective tissue in a small region beneath the ulcer. No intraepidermal spread such as occurs in Paget's disease has been found and carcinoma has not been found in the deeper tissues of the breast." After consultation with Professor K. Inglis, prophylactic irradiation was administered to the breast and lymph glands. At the patient's monthly visit in January, 1955, she reported that she had undergone a resection of the recto-sigmoid at Wollongong. The lesion was stated to be a primary carcinoma with involvement of the paracolic glands. In July, 1957, a small, firm, indefinite tumour was noted in the lower outer quadrant of the right breast. Mr. J. Yeates performed a radical mastectomy. The report was that there was a scirrhous new growth in the lateral quadrant, seven centimetres from the nipple scar and one centimetre in diameter. Microscopic examination of sections showed it to be a scirrhous carcinoma. There was no metatastatic carcinoma in the lymph nodes. She had been free of recurrence since. In July, she complained of constipation and of bleeding *per rectum* and she had a barium enema X-ray examination, which gave normal findings.

In March, 1958, examination *per rectum* at the follow-up clinic revealed a mass in the lateral wall of the rectum, which bled on contact. A biopsy specimen was taken, and showed an infiltrating adenocarcinoma. An abdomino-perineal resection was performed by Mr. Yeates. Examination of sections confirmed the biopsy diagnosis. She had been last examined in September, 1958, in good health and without recurrence.

Retinal Vascular Disease.

DR. B. G. HILL gave a demonstration of histo-pathological sections illustrating some aspects of retinal vascular disease, and correlated them with fundus appearances. The demonstration was illustrated diagrammatically. Features shown supported the hypothesis that the reaction in the retina to the hypertensive stimulus was governed by the normal aging process of the retinal arterioles.

Fundus Photography.

DR. G. D. CUMMING showed slides of various conditions of the fundus oculi, which were actual photographs taken at Sydney Hospital. He said that retinal photography had a very valuable future in respect to accurate recordings of progress or otherwise of various diseases such as hypertension, tumours, etc.

Bowen's Disease of the Vulva.

MR. S. DEVENISH MEARES discussed Bowen's disease of the vulva. He said that in 1912 Bowen had described two cases of intradermal carcinoma in men, one in the buttock and one in the forearm. Thirty cases of similar character in the vulva had since been reported. The ages of the patients varied from 25 to 81 years. The condition was characterized by a dull red, slightly raised, well-defined area, with a serpiginous margin. It was often moist and eczematous, and there might be crusts present. Alternatively, those areas might be small and multiple. The commonest symptom was pruritus. Microscopically, hyperkeratosis and hypertrophy of the Malpighian layer were present, with loss of normal stratification and malignant changes in the cells. Also increased vascularity and round-cell infiltration of the chorium were present, with loss of elastic tissue, which led to hyalinization. In addition, there were degenerate nuclei clumped together in clear spaces forming "round bodies" or Bowenoid cells. The basement membrane was intact. Treatment was by excision of the vulva.

Mr. Devenish Meares then showed a married woman, aged 63 years, who had had 16 children. Menstruation had ceased 15 years earlier. She had suffered from pruritus vulvæ for many years, and eight years prior to the meeting, to alleviate the condition, the vulva was treated with X rays. She first reported to Sydney Hospital in 1952. Atrophy of the vulva was then seen, with leucoplakia and an ulcer on the posterior fourchette. Microscopic examination of tissue removed by biopsy showed actively inflamed granulation tissue, and examination of the surrounding skin revealed irregular thickening of the dermis, hyaline change, moderate œdema, and chronic inflammation, consistent with previous irradiation. Thereafter she reported to the clinic every six months.

In September, 1955, there was an ulcer near the clitoris. A biopsy specimen was taken, and an intraepidermal squamous carcinoma analogous to Bowen's disease was found. In October a simple vulvectomy was performed. When the specimen was examined histologically, no further areas of Bowen's disease were found, but there were areas of leucoplakia and of lichen atrophicus. She had been last examined in February, 1957. There was no complaint of pruritus, and no sign of recurrence.

Carcinoma-in-Situ.

Mr. Meares then showed a married woman, aged 63 years, who had reported three years earlier, when she complained of pruritus vulvæ of two years' duration. There was a dull, red, raised, well defined area with a serpiginous outline. In places it was eczematous. Examination of a biopsy specimen revealed carcinoma-in-situ, and simple vulvectomy was performed. She was last examined in February, 1958, when there was no sign of recurrence.

Paget's Disease of the Vulva.

Mr. Deavenish Meares then showed a married woman, a half-caste aboriginal, aged 56 years, who had had 10 children. Her menstrual periods had ceased six years before. For two years she had suffered from irritation of the vulva. It was seen that most of the skin surface of the mons veneris and the labia majora was swollen, red and weeping, with many well-defined small white islets. All investigations and tests failed to reveal the presence of either acute or chronic infection. Histological examination of tissue removed by biopsy showed the typical features of Paget's disease. A simple vulvectomy had been performed by Mr. A. R. H. Duggan.

Mr. Meares said that over 58 cases of Paget's disease of the vulva had been reported, but Bowman and Hartman (1954) accepted only 17. The symptoms were burning and itching. The lesion appeared as a red, raised, moist, glazed, elevated, indurated patch. The patches at times were small and interspersed with sharply demarcated white islands. Some areas might show granulation. On microscopic examination, every level of the epidermis was seen to be thickened and distorted by masses of large, clear, rounded or oval cells, with pale, finely granular cytoplasm, the nuclei mostly being pale, with fine granular chromatin and prominent nucleoli. Degeneration and vacuolation were prominent. The shape of the epithelial cells might be altered by pressure, but otherwise the cells were unchanged, without any signs of malignant transformation. The basement membrane was intact. Mr. Meares said that in half the cases a carcinoma in deeply placed sweat glands had been found, and the view was now held that Paget's disease of the vulva consisted of intradermal metastases from carcinoma of an apocrine gland. That view was supported by recent histo-chemical studies. Dockerty and Pratt (1952) had shown that Paget's cells were mucin-containing signet-ring cells. Lennox and Pearse (1954) had stated that the presence of mucin in any quantity in a skin tumour was almost invariably a sign of sweat gland origin. The Paget's cells gave a positive periodic acid Schiff reaction, which persisted after diastase treatment. In at least five of the 15 accepted cases of Paget's disease of the vulva reported there had been metastases to glands, some of them widespread (Rosser and Hamlin, 1957).

Fœtal Electrocardiography and Stethography.

DR. J. DAVIS and MR. S. DEVENISH MEARES presented tracings showing fœtal electrocardiograms, and referred to the work of Hon on the difficulties of interpretation of fœtal electrocardiograms during labour. It was pointed out that in recent years the maternal mortality rate had

fallen greatly. For the State of New South Wales, the rate per 1000 live births in the period 1927 to 1936 was five to six, and in the period 1952 to 1955 less than one. However, the perinatal mortality rate still remained high. The stillbirth rate per thousand total livebirths and stillbirths in 1936 was 29·8, and in 1955 it was 16·54. As a result, more and more attention was being paid to the cause and prevention of stillbirth and neonatal death. One of the essential first steps in that study must be to develop means of remaining informed of how the fœtus was faring in the uterus. Over the years, the only means had been the perception of fœtal movements and the auscultation of the fœtal heart sounds. The findings obtained at those examinations indicated only three degrees of fœtal welfare—life, imminent death or death itself. It was the perception of all the finer grades of fœtal welfare between life and impending death which would give warning in time for measures to be taken to prevent fœtal death. As investigation proceeded, more and more ways were being found of gaining information of what was going on within "the iron curtain", the amniotic sac. The first additional method was by the use of X rays. Films would show fœtal death some days after its occurrence, and also fœtal deformity either developmental—as, for example, anencephaly—or pathological, such as erythroblastosis, and might localize the placenta. Further information about fœtal welfare had recently been obtained by direct assault on the sac with hollow needles and the obtaining of amniotic fluid for examination. By that method Bevis (1952) had been able to estimate the iron and bilirubin content of the liquor in patients who had anti-Rh agglutinins, and so indirectly gauge the degree of affection of the fœtus. Similarly, Dewhurst (1956) had been able to determine the sex of the fœtus, and Fuchs (1956) the fœtal blood group. By a less direct method, McLure Browne and Veal, with the use of radioactive sodium, had been able to determine quantitative variations in the blood flow in the placenta, which pointed to a disturbance of fœtal welfare. Those were all indirect methods. Three methods of gaining information directly from the fœtus in utero were gradually being developed—fœtal electroencephalography, fœtal electrocardiography and fœtal stethography. Fœtal electrocardiography had been studied for years. The first record had been made by Cremer in 1906. It was not till 1938 that a series of recordings was reported (Bell, 1938). Altogether, there had been over 2000 recordings. During the past few years workers had claimed that fœtal electrocardiograms could be obtained in 90% to 100% of pregnancies between the fœtal age groups of 17 weeks and term.

It was stated that there were several practical uses of fœtal electrocardiography. First, the obtaining of a fœtal electrocardiogram was a positive sign of pregnancy of the same accuracy as the classical signs of feeling fœtal parts, feeling fœtal movements and hearing fœtal heart sounds. It was a sign also of the same accuracy as the detection of the fœtal skeleton in skiagrams. Unlike X rays, it could not possibly do harm to the fœtus, however immature it might be. Secondly, a fœtal electrocardiogram gave immediate absolute proof that the fœtus was alive. That was of value in cases of suspected missed abortion, and in suspected hydatidiform mole. On rare occasions it might be of value when Cæsarean section was contemplated and for one reason or another there was difficulty in hearing the fœtal heart sounds. Thirdly, the fœtal electrocardiogram might determine the presentation of the fœtus. Fourthly, multiple pregnancy could be positively diagnosed. That was possible at a stage in pregnancy at least as early as by any other method, including radiography.

Other suggestions had been made as to the use of fœtal electrocardiography. First, it was used as an early test for pregnancy. The human heart commenced to beat at the third week of intrauterine life (Keith). With the present apparatus, electrocardiograms had been obtained as early as 16 weeks after the beginning of the last menstrual period. Secondly, it was used to detect congenital deformities of the heart during intrauterine life. It was unlikely that it would be a practical measure until clear *P* waves could be demonstrated. Dr. Davis and Mr. Meares had demonstrated intrauterine fœtal cardiac abnormality in one case. Thirdly, it was used to detect fœtal distress. Changes in the rate and the presence of an irregular rhythm of the *QRS* waves did not denote fœtal distress, for they occurred in its absence. A decrease in the amplitude and width of the *R* wave might prove to be of significance. Recently, Hon had shown the importance of instantaneous recording of the cardiac rate in that connexion. Fourthly, it was used to detect the effects of toxic substances on the fœtus—such substances as narcotics, analgesics, and oxytocic and cardiac drugs. Fifthly, it was used to disclose the effect of maternal disturbance on the fœtus, such as infections, fevers, toxæmia, anti-Rh agglutinins and electrolytic imbalance.

Laryngectomy.

MR. DOUGLAS G. CARRUTHERS showed two patients who had had laryngectomies for cancer. Aided by antibiotic prophylaxis and by feeding through a fine soft nasal tube, healing was complete and uneventful in both patients after four weeks. The operation was very well tolerated, both patients being aged over 60 years. In one there had previously been a long-standing pulmonary tuberculous infection, which had required thoracotomy for control. The patients demonstrated the ability to master the temporary loss of voice through œsophageal speech.

Management of Deafness.

Mr. Carruthers also showed two patients who were deaf as a result of large tympanic perforations, which had occurred after middle-ear infection. The infection had been overcome, and the perforations were closed with the use of split-thickness skin grafts after the margins of the perforation had been freshened. The operations had been performed under high magnification with fine, specially devised instruments. With closure of the perforation, hearing was greatly improved in each instance.

Chronic Anxiety Neurosis Associated with Angio-Fibro-Lipomata.

DR. B. H. PETERSON showed a divorced woman, aged 54 years, who had had two children. She suffered from a chronic anxiety neurosis associated with multiple angio-fibro-lipomata. The patient had first been seen at the psychiatric out-patient department in 1953, and she had been attending at irregular intervals since. Her symptoms were still present, with periodic exacerbations associated with emotional upsets. For many years she had had numerous symptoms, chiefly severe anxiety and tension, palpitations, hot flushes, depression, and a "dreadful hammering and swelling in the nose", the inside of which felt like "raw flesh". She felt life was not worth living, and said that her mind seemed to say that she was sick all the time. Since the age of 10 years, she had had recurrent cystitis, and nearly all tablets and medicines made her "urine and bladder burn". Sleep was light and restless, and she got weekly "migraine heads" with vomiting. For over 20 years she had had small, painful lumps on the thighs, arms and buttocks, which became more painful and tense when she was emotionally upset or cold. Examination of a biopsy specimen at another hospital a few years earlier was reported to have revealed angio-fibro-lipoma. She had had electroconvulsive therapy at another hospital in 1951, without benefit. Her ovaries had been removed in 1940, and later her uterus. She had lived in unhappy circumstances most of her life. Her parents were separated for some years, and her mother was alcoholic, promiscuous, dominating and hypochondriacal. One brother was an alcoholic and had attempted suicide. Her own marriage was unhappy both emotionally and physically, and ended in divorce in 1949. At the time of the meeting she lived with a married daughter who, she felt, did not give her enough sympathy. The patient was loath to give up her daughter to her son-in-law. She worked as a book-binder, with intervals of unemployment because of her symptoms. She was of average intelligence and of an obsessional, worrisome temperament.

On physical examination, she was found to be a healthy-looking woman of slightly obese physique, with mild tachycardia and exaggerated deep reflexes. All other findings, including the basal metabolic rate, were normal, except for a few pus cells in the urine at intervals. The lumps were about half to one inch in diameter, mobile and tender.

Dr. Peterson suggested that those tumours might have originated as small areas of localized panniculitis in the deep subcutaneous fat, and later developed into multiple angio-fibro-lipomata or mild Dercum's disease. The association with a chronic severe anxiety neurosis was of interest. It might be fortuitous, but it was tempting to postulate that the original panniculitis, which was a fibrositic disorder, might come within that group of rheumatic illnesses which some authorities regarded as psychogenic. At any rate, there was no doubt that that patient had been subjected to repeated emotional stresses for many years, and that those stresses were associated with exacerbations of pain and tension in her tumours. The only treatment that had given any relief so far was supportive superficial psychotherapy and small doses of "Amytal".

Reticulosis of Bone.

DR. P. M. CORLETTE showed a series of films of various types of reticulosis which affected bone. First, films were shown of Hodgkin's disease involving the vertebræ. The films showed the early changes of dense sclerosis in the vertebræ, to the final stage of almost complete destruction of three lumbar vertebræ. A case of solitary reticulosarcoma affecting the superior pubic ramus in a man of thirty was also discussed. He had received a course of radiotherapy (3000r) in 1955, and progress films until the present date showed complete reformation of bone. Films showing deposits in the left clavicle and humerus in a patient originally suffering from Brill-Symmer's disease with later transformation to lymphosarcoma were also shown. Finally, the films were shown of another patient (in the care of Dr. R. C. Scobie), who had a solitary plasmocytoma affecting the left side of the pelvis and acetabulum, which had been kept in control for some four years by means of irradiation.

Intensity-Time Curves (Strength-Duration Curves).

The staff of the physiotherapy department displayed graphs showing a series of intensity-time curves. The graphs demonstrated the flattening of the curve and extension of the curve towards shorter time (to the left), which occurred prior to the recovery of voluntary power in the paralysed muscles of a patient with a lower motor neuron lesion.

A patient who was undergoing a course of galvanic stimulation for facial paralysis was shown, and the intensity-time curve graphs of his paralysed facial muscles were displayed.

Abnormal X-Ray Shadows in the Right Hemithorax.

DR. D. G. MAITLAND demonstrated a series of X-ray films, showing abnormal shadows in the right hemithorax. Four of the films showed identical shadow projections, yet the final diagnosis was different in each case. Other films showed (i) the unusual shadow form of a large tuberculous cavity, without visible pulmonary spread of infection elsewhere, and (ii) hydatid disease of the lung. All Dr. Maitland's cases were selected in order to stress the importance of the clinical history and the correlation of clinical and pathological tests with the radiological findings before a diagnosis could be made.

Post-Partum Hypopituitarism.

DR. BERNARD LAKE showed a patient with post-partum hypopituitarism, the onset of symptoms having been some 15 years after confinement. The presentation was by "funny turns" previously labelled neurotic. The diagnosis was made on the history and fully confirmed by relevant target organ studies and by an ACTH stimulation test.

Ankylosing Spondylitis.

Dr. Lake also showed a patient with ankylosing spondylitis of 17 years' duration, who demonstrated the pitfalls in the management and the complications of the condition. There was present an aortic diastolic murmur for diagnosis, but there were no other symptoms or signs of aortic incompetence and no apparent positional change of the heart.

Johanson Operation for Urethral Stricture.

MR. JOHN E. BLACKMAN first outlined the development of the Johanson operation for urethral stricture, and showed lantern slides of the various procedures leading to that development, commencing with Hamilton Russell (1915). The more recent principle of burying a strip of skin in order to form a new urethra was outlined, and the methods reported by Bonnin, Swinney and Johanson were shown. Mr. Blackman then discussed two patients on whom the operation had been completed.

The first was a male patient, aged 54 years, who had had a deep bulbar stricture (Neisserian) since 1948, which had required constant dilatation. More recently, attacks of pyelonephritis had occurred after instrumentation, and the patient also suffered from angina pectoris. The stricture was a difficult one and required anæsthesia, and it was because of that that operation was undertaken. The first stage was performed in April, 1958, and the second stage three months later. Mr. Blackman emphasized that at the first stage all the strictured area including the area of periurethral fibrosis should be widely excised, and that usually a ribbon of urethra could be left on the roof, which was sutured laterally to the perineal skin. However, if that ribbon of urethra had to be excised, the perineal skin could be approximated in the mid-line, and sutured carefully to the proximal and distal openings of the normal urethra. In between stages the patient passed urine with complete control through the proximal opening in the perineum. At the second stage, a strip of skin between the normal proximal and distal parts of the urethra two and a half centimetres wide was buried, and the perineal skin on each side was widely undercut and approximated over the broad base with double-stop sutures. Healing had been complete without fistula formation, and the perineal skin was quite supple three months after operation. The patient now had a good urinary stream, a 10/13 Lister's sound passed easily, and the urine was clear.

Mr. Blackman remarked that for deep perineal and membranous strictures, Johanson had described a scrotal pull-through manœuvre, which seemed unnecessary and complicated. There appeared to be ample skin in the perineal region to complete both stages without undue tension, but some under-cutting of the skin might be necessary. Mr. Blackman thought that that type of urethroplasty had a definite place in the treatment of difficult urethral strictures which did not respond to instrumentation.

MR. IAN F. POTTS showed a patient who demonstrated the completed first stage of the operation. He pointed out that the operation, in effect, was a modification of Denis Browne's operation for hypospadias, the first stage being the creation of an artificial hypospadiac meatus proximal to the stricture, and the second stage the closure of that meatus after the method of Denis Browne. The operation was indicated only for severe strictures, usually impermeable, and unresponsive to simpler measures. A favourable result might free the patient from the necessity of any further urethral dilatations, and represented a major advance in the treatment of a difficult condition. The patient, aged 65 years, had had a known post-gonococcal urethral stricture for over 30 years. Over the years he had had two suprapubic lithotomies and two litholapaxies for bladder calculi. He had also had two cystostomies for episodes of retention of urine, when his stricture had been impermeable. In recent years he had had an internal urethrotomy, without much benefit. For the past three years he had been attending for urethral dilatation every two to three weeks. The stricture was cartilaginous in nature, and admitted only a 9/12 Lister curved sound, under an anæsthetic, and that with considerable force. The patient's renal function was poor; his resting blood urea content was about 80 milligrammes per 100 millilitres. The intravenous pyelogram showed bilateral hydroureter and hydronephrosis. He was anæmic, and prone to attacks of pyelonephritis after each dilatation. A urethrogram showed a long stricture, which involved the whole of the bulb and extended into the membranous urethra. The operation was performed with the patient in the lithotomy position. A suprapubic cystostomy was first fashioned. A sound was then passed down the urethra to the face of the stricture, and the bulb of the urethra was opened onto the point of the sound. The urethra was then divided proximally (towards the bladder) lengthwise, throughout the full length of the stricture; that involved some division of the external sphincter. The latter was not recognized as such, as the tissues were so fibrotic that definition was impossible. Excess scar tissue, from previous periurethral abscesses, was also excised widely. The stricture was incised proximally until a sound could be passed easily into the bladder without any "hang" or "catch". The roof of the urethra was left intact, and all that remained to be done was to suture the skin edges to the cut edges of the divided floor of the urethra. To have closed the wound in the usual vertical fashion would have involved considerable tension at the apex of the wound (at the level of the mebranous urethra). To overcome that, two triangular flaps were cut, based posteriorly with the apices anteriorly, and the apices were swung into the depths of the wound to be anastomosed to the membranous urethra. A rectangular flap was developed on the right side, and was swung down to be sutured to the divided edge of the urethra. On the left side, the perineal skin allowed direct suturing without tension. When seen at the time of the meeting, healing being complete after that stage, the patient had a hypospadiac meatus in the perineum, which led directly into the bladder. There was a gutter about one and a half inches long, the roof of which was the urethra, and which had undergone some metaplasia, and that ran into a meatus, which was the proximal meatus of the distal (penile) urethra. Interestingly enough, his continence of urine had not been interfered with. He was then ready for the second stage; his renal function had improved, and his previous anæmia had been relieved. Prior to the second stage, hairs on the skin, which would ultimately be buried, would be destroyed by electrolysis,

so as to prevent the subsequent development of ureteral calculi.

Carcinoma of the Breast.

MR. J. M. YEATES showed three patients with carcinoma of the breast.

The first was a woman, aged 47 years, who had presented on July 16, 1958. For nine months she had been aware of a lump near the breast bone which had steadily increased in size. It had been regarded as a tumour of the chest wall, and had been thought innocent. Examination of the patient revealed a very hard lump, 2·5 centimetres in diameter, overlying the second left costal cartilage, and somewhat adherent to the fascia. The interesting feature was that it had no apparent relation to the protuberant breast. But when the patient leaned well forward (as advised by Haagensen) with the breast fully dependent, it was clear that the lump was indeed in the breast. There was some skin attachment, but no nodes were palpable. Complete investigation failed to demonstrate metastases. Triple biopsy was performed on July 28. First, a biopsy of the lump was taken, and examination revealed the tumour to be scirrhous carcinoma. Secondly a biopsy of the internal mammary nodes was taken; they were removed *en bloc* with the vessels and fat, after excision of part of the second and third rib cartilages. Only one node appeared a trifle enlarged. This was found to have a small area of carcinoma at its centre. The rest of the tissue was free. Thirdly, a biopsy was taken from the highest axillary node, which was found not to be involved. In the light of this evidence it was felt that although the carcinoma had been present for a considerable time and had itself waxed fat, it had as yet not spread its roots far. Radical mastectomy with primary skin graft was therefore performed one week after the biopsy. The pathologist reported that the carcinoma extended from close to the skin down to the pectoral muscle, and was three centimetres in maximum extent, and nine centimetres from the nipple. No axillary nodes were involved.

The second patient shown by Mr. Yeates was a married woman, aged 41 years, without living children. She had reported on February 12, 1958, that she had noticed 10 bouts of bleeding from the left nipple since December, 1957. In the last few weeks the discharge had been yellow rather than bloody. The breasts were particularly small, and the left breast appeared normal except for the rather vague presence of a very small lump under the margin of the areola towards the axilla. Pressure there produced a yellow discharge. No regional nodes were evident. Although carcinoma was not considered likely as the cause of the symptoms, the axillary sector of the breast was excised on July 21. Examination of a frozen section revealed intraduct carcinoma. The operation was concluded as a radical mastectomy, with closure by dermatome graft from the thigh. Examination of paraffin sections confirmed the presence of intraduct carcinoma, and also infiltrating carcinoma in one region. No node metastases were found.

The third patient was a woman, aged 76 years, who on June 30, 1958, had reported a lump in the left breast which had been present for at least three months. The lump was found to be in the upper outer quadrant, and to measure 2·5 centimetres in diameter. There was no fixation and no nodes were palpable. Radical mastectomy was performed after confirmation of the presence of carcinoma by biopsy. The wound was closed with the aid of skin graft. Two nodes were found to be involved.

Mr. Yeates said that the three patients were shown not only for the inherent interest of their clinical patterns, but to illustrate treatment by the type of radical mastectomy described by Professor C. D. Haagensen. His main points were: (i) routine biopsy to confirm the diagnosis of cancer; (ii) node biopsies in certain borderline cases; (iii) wider skin excision; (iv) very thin flaps; (v) sharp dissection of axillary vein; (vi) absolute hæmostasis; (vii) avoidance of drainage tubes; (viii) routine use of skin grafting. In his hands, the reward for that meticulous technique was sound healing without tension as early as the tenth day. In the case of the patients demonstrated, although the results were not up to that standard, it was thought that the improvement over suture-under-tension methods was striking. Not the least important aspect was the favourable impression received by the patients, who appreciated the early removal of dressings and easy movement of the arm. The operation appeared much less formidable, and Mr. Yeates hoped that its wider use might help to reduce that well known lag of about nine months which women were apt to spend in fearful contemplation of possible mutilation.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

AS OTHERS SEE US.

MEDICINE IN AUSTRALASIA.[1]

By William Osler M.D., F.R.C.P., Professor of Medicine Johns Hopkins University Baltimore U.S.A.

[From the *Australasian Medical Gazette*, November 20, 1897.]

THE following remarks being part of the address in Medicine delivered at the annual meeting of the B.M. Assn., Montreal, September 1897, entitled "British Medicine in Greater Britain" from the lips of the above distinguished member of our profession, are worthy of our most careful consideration, representing, as they do, the opinions of a matured professional mind, unbiassed by Australasian local interests:—

Medicine in Australasia

In certain respects the Australasian settlements present the most interesting professional problems of Greater Britain. More homogeneous, thoroughly British, isolated, distant, they must work out their destiny with a less stringent environment than, for example, surrounds the English in Canada. The traditions are more uniform, and, of whatever character, have filtered through British channels. The professional population of native trained men is as yet small, and the proportion of graduates and licentiates from the English, Scotch and Irish Colleges and Boards guarantees the dominance of old country ideas. What the maturity will show cannot be predicted, but the vigorous infancy is full of "crescent promise". On looking over the files of Australian and New Zealand journals one is impressed with the monotonous similarity of the diseases in the Antipodes to those of Great Britain and of this continent. Except in the matter of parasitic infections and snake-bites, the nosology presents few distinctive qualities. The proceedings of the four Intercolonial Congresses indicate a high level of professional thought. In two points Australia has not progressed as other parts of Greater Britain. The satisfactory regulation of practice, so early settled in Canada, has been beset with many difficulties. Both in the United States and in Australia the absence of the military element which was so strong in Canada, may, in part at least, account for the great difference which has prevailed in this matter of the State licence. The other relates to the question of ethics, to which one does not care to refer, were it not absolutely forced on the attention in reading the journals. Elsewhere professional squabbles, always so unseemly and distressing, are happily becoming very rare, and in Great Britain and on this side of the water, we try at any rate to wash our dirty linen at home. In the large Australian cities differences and dissensions seem lamentably common. Surely they must be fomented by the atrocious system of election to the hospitals, which plunges the entire profession every third or fourth year into the throes of a contest in which the candidates have to solicit the suffrages of from 2000 to 4000 voters. Well indeed might Dr. Batchelor, in his address to the Fourth Intercolonial Congress say: "It is a scandal that in any British community, much less in a community which takes pride in a progressive spirit, such a pernicious system should survive for an hour."

Correspondence.

TETANUS PROPHYLAXIS.

SIR: The policy of using tetanus antitoxin for the passive prophylaxis of tetanus has been seriously questioned in your columns. Dr. K. D. Murray[1] stated that he had found no evidence to suggest that tetanus antitoxin had any prophylactic value against tetanus following accidental trauma in humans. He considered it to be both dangerous

[1] From the original in the Mitchell Library, Sydney.

[1] MED. J. AUST., 1959, 2: 659 (October 31).

and useless, and its exhibition a waste of public money. This is a serious challenge to accepted thinking, and one that needs careful examination. The passive prophylaxis of tetanus is a problem that, without any doubt, presents difficulties, dangers, if not used with due care, and some shortcomings. Before examining the evidence on which the use of prophylactic tetanus antitoxin is based, there are several points which should be kept clearly in mind.

On the one hand, tetanus is a horrible and dangerous disease with a high mortality, which has resulted in 234 deaths in Australia over the last five years. This exceeds the combined mortality of diphtheria, whooping cough, mumps and scarlet fever. Secondly, protection is highly desirable, and tetanus antitoxin is the only prophylactic agent that is of possible value in non-actively immunized persons. Thirdly, while the death of sometimes one, sometimes none, or rarely two persons annually in Australia from prophylactic tetanus antitoxin is a tragedy of a high order, so also are the 55 deaths annually from tetanus, the average figure for the years 1950-1958 inclusive.

On the other hand, there is a risk of anaphylaxis which requires very careful attention. Nevertheless, with care and the proper technique, anaphylaxis should be largely, if not completely, preventible, while established tetanus still carries a 40%-50% mortality. In addition, there are difficulties attendant on the use of tetanus antitoxin in practice which can be a great burden to the busy practitioner or casualty department. The indications for passive prophylaxis are held to be so broad by some that every break in the skin or minor crushing injury or burn requires its employment. The doctor is faced with the rare but real danger of tetanus if he omits to give antitoxin, or the very rare danger of a severe generalized reaction if he gives it. There may be doubt in his mind as to its efficacy, and there is the time-consuming nature of the procedure if properly performed.

These then are the problems, the difficulties and the dangers. Although doubts have been raised before about the efficacy of tetanus antitoxin as a prophylactic agent, Australia is not alone in its employment. Its use is generally accepted throughout the world, and it is employed in all civilized countries. There are some isolated dissentients from this general concurrence, of which the Royal Newcastle Hospital is an example in this country. It is a point of view which must be respected if adequate evidence cannot be advanced to justify the prophylactic use of tetanus antitoxin. This question will be examined in some detail below, but first let us consider the real dangers of fatal anaphylaxis.

The dangers of a fatal anaphylactic reaction are exaggerated in some minds and in the figures of some writers. It has been stated more than once that there are more deaths from tetanus antitoxin than from tetanus itself. This is far from true, for the ratio over a period in Australia is about 55 deaths from tetanus per year to one from anaphylaxis. The important consideration is the proportion of deaths from anaphylaxis due to prophylactic use of tetanus antitoxin to the number of doses administered. This has been placed at 1 : 50,000-1 : 200,000 by Laurent and Parish.[2] Dr. W. F. Hunter[3] states that Laurent and Parish's figures are unsupported. However, Park[4] found an incidence of fatal reactions of 1 : 50,000 in 350,000 cases, and Schiebel[5] gives a figure of 1 : 100,000.

The figures of Kojis[6] of 1: 1250 quoted by Dr. Hunter[3] relate to 5 deaths in 6211 cases, and are very misleading in the present context. They do not apply to the prophylactic use of tetanus antitoxin, but to the therapeutic use of other sera, namely diphtheria antitoxin and streptococcal antitoxin. In three cases, death followed 10,000-15,000 units of serum given 7 to 15 days after one or more large preceding doses, while in the remaining two, 1 ml. or 2 ml. of undiluted serum was given intravenously 14 and 20 days after a sensitizing dose.

My own inquiry into the relative incidence of deaths in Australia to numbers of doses of prophylactic antitoxin yielded figures of about 1: 300,000. This was made originally over the years 1950-1955 inclusive. It was not possible to find the exact number of deaths, for since the 1948 International Revision of Causes of Death they have been recorded under the categories 944 "Other complications of prophylactic inoculation" and 951 "Therapeutic misadventure in infusion or transfusion". The breakdown of these figures is not feasible.

The total number of deaths under both categories together for the six years was 16, an average of 2·6 per year. This would be the upper limit if every death in both categories was due to fatal reactions to prophylactic tetanus antitoxin. This is very unlikely. Furthermore, nearly all, if not all, such cases are reported to the Laboratories or appear in the Press. In those six years, six fatal cases came to our knowledge, one of which was of doubtful ætiology. During that time a yearly average of 507,000 ampoules of tetanus antitoxin were issued for human use. The dose sizes were 500, 1000 and 1500 units. As the years progressed, the relative number of 1500-unit ampoules increased, while the others diminished and have since been discontinued. One may consider that each ampoule was used as a separate prophylactic dose or, alternatively, that the smaller sizes were amalgamated to produce a 1500-unit dose. The maximum number of doses in one year would be 507,000, while the minimum would be 283,000 if all doses were 1500 units. The true number lies somewhere in between, because it is well known that 500 and 1000 units continued to be used for some time after the recommendations were made that 1500 units was the most suitable dose. In some instances, more than 1500 units may have been given at one time, but this would be rare. A figure can be arrived at by comparing the known number of deaths for the six years—one per year—and the minimum number of doses for one year—283,000—giving a ratio of 1: 283,000.

There may have been more deaths from anaphylaxis than the six known ones, but again it is possible that 500,000 doses were given in each year.

In the three subsequent years, a more accurate assessment can be made of the total doses administered. The smaller sizes were discontinued, and a yearly average of 385,000 doses of 1500 units was issued. This is almost half-way between the two extremes cited above. In that time, three deaths have come to our knowledge, and the ratio on these figures is 1 death per 385,000 doses of tetanus antitoxin, and this may well be the figure for the nine years studied. A figure of 1: 300,000 would certainly be a safe assessment, and would allow for wastage.

In the deaths considered, no account has been taken of the method and precautions used in the administration of the tetanus antitoxin, i.e. whether preliminary sensitivity testing was carried out, whether dilute or undilute serum was used, which route was employed, whether the patient was observed for an adequate period afterwards, and whether resuscitative means were immediately available. The general recommendations for testing and observation were not then as stringent or all-embracing as they are now. In each case known in any detail, there was a feature that could be overcome in the light of present knowledge. Despite this, only one death in 300,000 doses occurred.

With the technique now advocated of a subcutaneous trial dose of dilute tetanus antitoxin in all cases, with adequate observation and facilities for treatment on hand, this small risk should be almost, if not completely, abolished. Certainly no deaths have occurred when the present technique has been employed, that is, on about 100,000 occasions to our knowledge.

The risks attendant on the administration have been considered, and now the efficacy or otherwise of prophylactic tetanus antitoxin must be carefully examined. One common error is to consider that tetanus antitoxin should be 100% effective, and if it is not so then it is useless whatever the circumstances of the case. This is biologically unsound, for no prophylactic or therapeutic procedure is perfect. Furthermore, even its most impassioned advocates would not claim more than 80%-90% reduction in incidence of tetanus in those with wounds likely to lead to that disease.

It is sometimes cited that a case or number of cases of tetanus developed despite a prophylactic dose of tetanus antitoxin. This is undeniable; it does happen, but it is not the point. The question is: how many are spared the development of this dread disease? In the first World War, one case of tetanus developed per 1000 wounded despite prophylactic antitoxin, but prior to the institution of this measure eight cases developed per 1000 wounded (Barr and Sachs[7]). This fall in incidence is the important point, and gives a measure of the effectiveness of the prophylactic procedure. Secondly, those that did develop tetanus despite antitoxin frequently had a longer incubation period, and, as is well known, the severity of established tetanus is frequently inversely proportional to

[2] *Brit. med. J.*, 1952, 1: 1294.
[3] MED. J. AUST., 1959, 2: 93 (July 18).
[4] *Trans. Amer. Ass. Phys.*, 1913, 28: 95.
[5] *Bull. Wld Hlth Org.*, 1955, 13: 382.
[6] *Amer. J. Dis. Child.*, 1942, 64: 91.
[7] "Report on the Investigation into the Prevention of Tetanus in the British Army", 1955, W.O. Code No. 11262: 13.

the length of the incubation period. Many of the cases of tetanus that did develop were mild, and local tetanus alone was not uncommon.

A further instance may be cited. All air raid casualties in London in the early stages of the last war were given 1500 units (USP) of tetanus antitoxin. Seven cases of tetanus developed in the 11,000 casualties so treated (Radley Smith[8]).

In the battle for Manila in 1945, an estimated 12,000 civilians were injured. No tetanus antitoxin was available, and almost 500 (473 *plus*) cases of tetanus resulted (Glen[9]). These findings are not strictly comparable because of the variation in terrain, nutrition and medical care, but the difference is certainly striking.

The two Great Wars have been the best proving grounds for tetanus prophylaxis either passive or active. Large numbers of persons receive wounds which through their nature and the delay in treatment are very prone to develop tetanus. They receive uniform treatment, and the results can be accurately assessed. In civil practice, unless there are large numbers of wounds occurring under similar circumstances, one can only examine the cases retrospectively, and this may be very misleading. For example, a total number of 167 patients with clinical tetanus were admitted to the hospitals in Baltimore from the years 1928 to 1953 (Stafford[10]). Of these 167 cases, 25 had received prophylactic tetanus antitoxin. On the surface this appears damning. On the other hand, of 558 cases of tetanus admitted to the Charity Hospital, New Orleans, only one had received passive prophylaxis (Creech[11]). This appears flattering. In actual fact, neither set of figures means anything. In the first instance, all it says is that 25 people developed tetanus despite tetanus antitoxin. These 25 could all be, statistically, in the 0·1% who develop tetanus despite passive prophylaxis. It takes no account of those who received passive prophylaxis and did not develop tetanus, which would be 99·9% on World War I figures. Needless to say, on this reasoning the very large majority would not have developed tetanus anyway: 99·1% in fact, leaving 0·8% who were protected from a horrible disease and a 50% chance of death.

In the second instance, it cannot be taken as proof of efficacy of prophylactic tetanus antitoxin that only one person so protected developed tetanus, for again we do not know how many were given tetanus antitoxin at the time of injury. This person might possibly have been the only one. Studies that deal only with the cases that have developed tetanus do not draw valid conclusions.

Another striking illustration of the fall in incidence of tetanus following the use of prophylactic tetanus antitoxin was the institution of such treatment to persons injured by fireworks in the U.S.A. Independence Day celebrations. In 1903, before the use of tetanus antitoxin, there were 102 deaths from tetanus per 1000 injuries. In the following year, with the introduction of prophylactic tetanus antitoxin, the deaths fell to 23 per 1000 injuries, and continued to decline to 3 per 1000 in 1913. Bosanquet and Eyre[12] state: "The records of Independence Day in the United States afford the best examples (to that time) of the systematic use of prophylactic doses of antitoxin." To this may be added the assessment of British Army Pathology Advisory Committee:[7] "a. The rapid reduction in incidence (of tetanus) from 8 per 1000 during the first months of the War to 1 per 1000 after the giving of antiserum to all at risk; b. The reduction of mortality consequent upon the increased incubation period . . . The high value of passive prophylaxis would appear to be the outstanding fact of the history of tetanus in the European War of 1914-1918." It is surely no valid criticism of this success that the initial fall in incidence was achieved by a dose of 500 units, as Dr. Hunter[8] would have us believe. In actual fact, the dosage was increased in subsequent years in an endeavour to further reduce the incidence and modify the severity of the disease. In 1918, 1500 units were being given. "Sir David Bruce, however, maintained that 500 units was adequate if subsequent doses could be guaranteed."[7]

These findings have been fully accepted by most, if not all, authorities, and form the basis of modern passive prophylaxis of tetanus. Prophylactic tetanus antitoxin is not perfect, but it is by no means useless.

The real point at issue is: "What is the place of tetanus antitoxin in civilian practice?" To take the two extreme points of view, the first is that any injury—break of the skin, contusion or minor burn—may lead to tetanus, and therefore antitoxin should be given in all cases. The second is that because tetanus antitoxin is not 100% effective and may carry some risk in its use, it is not justifiable because of the few cases of tetanus.

Both these points of view are open to some criticism. The fact that many or most cases of tetanus arise from trivial wounds does not mean that tetanus is equally common in minor clean lacerations and soil-contaminated compound fractures. Trivial injuries are legion, and few develop tetanus. Severe or deep penetrating injuries are comparatively rare, and if only 10% of cases of tetanus developed from these wounds, it would follow that the chance of developing tetanus from severe injuries is infinitely greater. Furthermore, severe injuries are much more likely to be treated and receive protective antitoxin than the minor wounds. They are less common, and they are better protected. However, a clean cut with a knife in a kitchen would carry a minimal risk, while a contaminated compound fracture would carry a maximal risk. This should not be forgotten.

The "no antitoxin" viewpoint refuses to give adequate protection in cases where the risk of tetanus is real, protection that reduces the incidence from 8 per 1000 to 1 per 1000 injuries. These are penetrating wounds, contaminated wounds, wounds that cannot be easily or satisfactorily cleaned, wounds where there is tissue damage or destruction, or infected wounds. These wounds are associated with 50% of cases of tetanus, a disproportionately large number when compared with the infinite number of trivial wounds. The risk of tetanus in these cases is considerable, while the risk of death from anaphylaxis, as has been shown, is very small indeed. If the procedure of administration now advocated[13] is followed carefully, I believe that deaths from anaphylaxis could be abolished or reduced to the minimal risk of any therapeutic procedure. There is a risk of death from vagal inhibition in any injection, but we must not allow this to affect our sense of proportion.

The correct approach lies somewhere between these two extremes. The long-standing recommendations of the laboratories could be followed with advantage: "Every person who has sustained a wound which may have become contaminated with soil, street dust or other sources likely to contain Cl. tetani and who has not been actively immunized against tetanus or whose immune state is in doubt, should receive a prophylactic dose of tetanus antitoxin." To wash and dress with antiseptic a clean cut or abrasion would be sensible clinical practice, while to neglect to give tetanus antitoxin to an unimmunized person who has driven a garden fork through his foot would be a very grave omission.

Tetanus will always be a potential threat in Australia. The interesting parallel between the fall in the incidence of tetanus per head of population and the decrease in the number of horses in Australia should not be allowed to raise too sanguine hopes. Even the disappearance of the horse would not lead to the disappearance of tetanus. "Tetanus is encountered in all classes of stock in Australia . . . Most cases are seen in horses and sheep. In the latter the disease is particularly serious, as a number of the animals is often affected at the same time . . . A survey of 45 soils in New South Wales in 1930 showed Clostridium tetani to be present in 8% of soils from grazing land, 13% of cultivated soils, and 5% of samples from dairy yards. It was not found in soil from unstocked and uncultivated areas."[14]

Tetanus antitoxin will continue to play a valuable part in safeguarding the community until such time as active immunization with tetanus toxoid is universal. It will take a combined effort on all our parts to achieve this highly desirable state. The protection afforded by active immunization against tetanus approaches as near to perfection as any prophylactic procedure, and is both simple and safe. The present interest in active tetanus immunization in Australia gives hope that the day when all persons are so immunized is not too far distant.

Yours, etc.,

G. F. TRINCA.

Commonwealth Serum Laboratories,
Parkville, N.2,
Victoria.

December 14, 1959.

[8] *Proc. roy. Soc. Med.*, 1942, 35, 340.
[9] *Ann. Surg.*, 1946, 124: 1030.
[10] *Ann. Surg.*, 1954, 140: 563.
[11] *Ann. Surg.*, 1957, 146: 369.
[12] "Serums, Vaccines and Toxoids", 1916, p. 152 (quoted by Barr and Sach[7]).
[13] MED. J. AUST., 1959, 1: 210 (February 7).
[14] "Diseases in Domestic Animals in Australia", Service publication, Dept. of Health, 1953, Part 5, Vol. 1, p. 78.

SIR: Removal of all foreign and necrotic material from the wound is essential, and, though continuing to use anti-tetanus serum (ATS), I believe proof of its value in humans is unobtainable. In U.S.A. in 1903 there were 406 tetanus deaths after 4449 injuries gained in celebrating the Fourth of July. A.T.S. was used in 1907 when only 62 deaths resulted from 4413 such injuries, but there was also "better and more general cleansing and drainage of wounds".[1] Not only surgical, but also military considerations bedevil Bruce's figures. These are much quoted and are probably relied upon by Fairbrother[3] and Cole[4] for their statements that the value of prophylactic A.T.S. was "conclusively demonstrated" and "proved conclusively" in the 1914-1918 war; but Bruce wrote:[5]

> Most of the cases occurred during September, October and November, 1914. This may have been due to the fact that the wounded were more exposed to contamination of their wounds at that time, which included the retreat from Mons; that there was less opportunity of receiving treatment as rapidly and as effectually as later on; that during this time the preventive use of antitetanic serum had not been developed as it has during the last six months, when it is reported that, wherever possible, every wounded man has received a prophylactic dose; and generally that experience has taught medical officers how better to cope with the conditions obtaining in time of war, to unlearn the lessons of modern aseptic surgery, and to revert to the older methods of free incisions, thorough drainage, and constant removal of septic products by baths or irrigation. At the present time it is impossible to say which of these factors has been the most important.

On October 10, 1914, Makins[6] wrote:

> One has only to look over the neighbouring fields to appreciate the amount of manure with which the soil is treated, since the agriculturists are now placing the manure on the fields beyond the fighting line prior to ploughing it in. One may well look back with envy to the clean soil of the South African veld. . . . An attempt to control its development by the administration of prophylactic doses of serum to all patients with severe open wounds, as soon as they are brought in from the fields is now being made.

On October 24, 1914, he wrote:[6]

> It is still too early to form any opinion as to the success of the prophylactic measures . . . advantage may be gained from the removal of our troops from a district in which tetanus is notoriously common amongst the civil population in times of peace.

Butler[7] called this period "the surgical débacle" because of "unintelligent reliance on the supposed asepticity of missile wounds which were closed by suture" with "effective surgery entirely done at the Base". Small wonder there was more tetanus when manured wounds were converted by sutures into septic cavities.

On the other hand, the numerical risk of generalized reaction to prophylactic A.T.S. is known. In his consolidated report, Bruce[8] wrote:

> In England alone during the war it is probable that some two millions of prophylactic doses of antitetanic serum have been given and of this huge number only 11 cases of shock have been reported. All 11 cases recovered.

Moynihan[9] recorded two "anaphylactic" reactions, neither fatal, after 7580 prophylactic injections. A.T.S. was repeated weekly in the care of thousands of wounds seen by Hughes and Banks,[10] who wrote: "We have never seen any anaphylactic symptoms result." Hence, as demonstrable antitoxin in the recipient is likely to be a benefit, the numerical risk of generalized reaction appears worth taking with the usual and modern precautions.[11,12] Incidentally, Blair Bell[13] suggested that several different species should be immunized, so as to reduce the risk of reaction to a specific foreign protein if A.T.S. has to be repeated. When contrasting failure of A.T.S. alone to prevent human tetanus with its most successful action in horses, Purves Stewart[14] noted that horses receive horse serum, while humans receive alien (horse) serum, and for hypersensitive patients Stafford, Turner and Goldman[15] suggested transfusion from a human donor with a high titre of antitoxin.

Yours, etc.,

W. W. WOODWARD.

15 Brisbane Street,
Launceston, Tasmania.
December 16, 1959.

[1] Jordan, E. O. (1908), "General Bacteriology", Philadelphia, Saunders: 313.
[2] "Textbook of Bacteriology" (1941), London, Heinemann: 332.
[3] *Practitioner* (1959), 183: 269.
[4] *Lancet* (1915), 2: 901.
[5] *Lancet* (1914), 2: 905.
[6] *Lancet* (1914), 2: 1005.
[7] "Australian Army Medical Services in the War of 1914-18", (1940), Vol. 2, Canberra, War Memorial.
[8] *J. Hyg.* (1920), 19: 1.
[9] *Brit. med. J.* (1956), 1: 260.
[10] "War Surgery" (1918), London, Baillière, Tindall & Cox: 173.
[11] Christensen, N. A. (1957), *Proc. Mayo Clin.*, 32: 160.
[12] Ackland, T. H. (1959), MED. J. AUST., 1: 185.
[13] *Lancet* (1914), 2: 1435.
[14] "Medical Annual" (1914), Bristol, Wright: 599.
[15] *Ann. Surg.* (1954), 140: 563.

Post-Graduate Work.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR FEBRUARY, 1960.

THE Melbourne Medical Post-Graduate Committee announces the following programme for February, 1960.

Anatomy.

On February 8, classes will commence for the D.P.M. at the Anatomy Department, University of Melbourne. There will be about 35 lectures, on Mondays and Wednesdays, chiefly at 12.45 and 2.15 p.m. The fee is £21, and enrolments, on their special form, should be made with the Committee by January 25.

On February 15, classes will commence for the M.S., F.R.A.C.S., F.F.A.R.A.C.S., M.G.O., D.O., D.L.O., D.A., D.D.R., D.T.R. and D.C.R.A. These will be held at 2.15 p.m. on Mondays and Wednesdays and continue for five months. The fee is £21, and enrolments should be received by the Committee by February 1.

Physiology.

On February 29, classes will commence at the Physiology *Department, University of Melbourne, for candidates for* the M.D., M.S., F.R.A.C.S., F.F.A.R.A.C.S., M.G.O., D.O., D.L.O., D.A., D.D.R. and D.P.M. These will be held on *Mondays and Wednesdays at 3.45 p.m., continuing for five* months. The fee is £21, and enrolments should be received by the Committee by February 15.

Country Courses.

Warragul.—On February 13, at the West Gippsland Base Hospital, Warragul, the following course will be held: 2.30 p.m., "The Management of Disproportion", Dr. F. M. C. Forster; 3.30 p.m., "Vaginal Discharge", Dr. A. R. Long; 4.45 p.m., "Resuscitation in the Newborn", Dr. W. H. Kitchen; 8 p.m., "Hormones in Gynæcology", Dr. J. W. Johnstone. The local secretary is Dr. J. E. Joseph, 237 Princes Highway, Morwell.

Ballarat.—On February 25, at Craig's Hotel, Ballarat, at 8 p.m., Mr. J. B. Curtis will discuss "Cervical Spondylosis". The local secretary is Dr. I. C. Goy, 22 Ripon Street, Ballarat.

Bendigo.—On February 26, at the Base Hospital, Bendigo, at 8 p.m., Dr. Ian Stahle will discuss "Common Skin Diseases". The local secretary is Dr. M. Clark, 98 Mitchell Street, Bendigo.

Terang.—On February 27, at Terang, the following lectures will be given: "Psychosomatic Medicine in Relation to Gastro-Intestinal Disease", Dr. W. E. King; "Common Eye Conditions: Diagnosis and Management in General Practice", Dr. W. D. Counsell.

Fees.—The fees for the above country lectures are at the rate of 15s. per sesson, but those who have paid an annual subscription to the Committee, as detailed in the syllabus sent to all members, are invited to attend without further charge.

RECORDED LECTURE.

The following recording has been added to the Committee's library of recorded lectures on microgroove disks *with 2 in. by 2 in. slides: "Cancer of the Cervix Uteri"*, a symposium conducted by the Melbourne Medical Post-Graduate Committee; nine short lectures by Dr. R. A. *Barter, Dr. G. Jacob, Dr. H. F. Bettinger*, Mr. J. M. Buchanan, Professor Lance Townsend, Mr. A. M. Hill, Dr. G. R. Kurrle, Mr. L. W. Gleadell and Mr. R. Fowler. The *disks run for two and a half hours*, with accompanying slides, and other information. *This is available on request*, without charge.

ADDRESS.

The Melbourne Medical Post-Graduate Committee is situated at 394 Albert Street, East Melbourne. Telephone: *FB 2547.*

Notes and News.

Nichols Fellowship.

The Council of the Royal Society of Medicine invites *applications for a grant of £160 per annum in aid of* research to be carried out to advance knowledge in obstetrics and gynæcology, which will be awarded on the *recommendation of the Council of the Section of Obstetrics* and Gynæcology of the Society.

The place at which the work is to be carried out and *an outline of the proposed research must be stated in the* application.

A preliminary report on the progress of the research *must be submitted at the expiration of the first six months.*

The fellowship will be awarded in the first place for a period of one year, and, at the discretion of the Council, may be extended for a second year.

Applications must be received by the Secretary, Royal Society of Medicine, 1 Wimpole Street, London, W.1, by April 9, 1960.

International Congress of Gastro-Enterology.

The sixth International *Congress of Gastro-Enterology* will be held at Leyden and Noordwijk aan Zee, the Netherlands, from April 20 to 24, 1960. The Congress is open to *all who are interested in gastro-enterology, physicians as* well as scientists. A preliminary notice of the Congress, with information about the programme, was published in *this Journal on January 3, 1959. Further details may be* obtained from the General Secretary, Dr. C. Schreuder, whose address is 16, Lange Voorhout, The Hague, The *Netherlands.*

Wanted: Back Numbers of the Journal.

A request has been received from the University of Siena, Italy, for the following back numbers of THE MEDICAL *JOURNAL OF AUSTRALIA:*

1958: May 3, 10, 31; June 14; July 5; August 16, 23; October 4.

If any reader has copies of these which they no longer require, we should be grateful to have them.

The Royal College of Obstetricians and Gynaecologists.

REGIONAL COUNCIL IN AUSTRALIA.

MRS. M. H. FOTHERINGHAM, O.B.E., has donated another £5000 to the Trust Fund of the Australian Regional *Council of the Royal College of Obstetricians and Gynæcologists, making the corpus of her gift to the* College £15,000. The purpose of the gift is to further research in obstetrics and gynæcology in the Commonwealth. *The Fotheringham Fellow for 1959 is Dr. Barry* Wren of Perth, and the subject of his research is: "To investigate the increased abortion rate associated with *matings of the incompatible blood groups A, B and O."*

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED DECEMBER 5, 1959.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1(1)	4(3)	1	..	..	..	..	..	6
Amœbiasis	..	..	..	*1(1)*	..	..	..	..	1
Ancylostomiasis	..	..	1	..	..	..	5	..	6
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	1(1)	17(15)	1(1)	..	1(1)	1	3	1	25
Diphtheria	..	..	..	1(1)	..	..	..	..	1
Dysentery (Bacillary)	..	3(3)	3(1)	..	..	..	..	..	6
Encephalitis	..	2(2)	..	1	..	..	..	..	3
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	5	..	..	..	..	..	..	..	5
Infective Hepatitis	63(10)	44(31)	23(3)	22(9)	4(2)	1(1)	..	..	157
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	1	..	3(1)	..	..	..	..	..	4
Malaria	..	1(1)	2(2)	..	1(1)	..	..	..	4
Meningococcal Infection	4(1)	..	..	..	..	..	..	..	4
Ophthalmia	..	..	..	..	2	..	..	..	2
Ornithosis	..	..	..	1(1)	..	..	..	..	1
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	1	..	..	..	..	..	..	..	1
Puerperal Fever	2	..	..	..	..	..	..	..	2
Rubella	..	18(9)	1	2(1)	1(1)	..	..	..	22
Salmonella Infection	..	..	..	1(1)	1(1)	..	..	..	2
Scarlet Fever	3(1)	13(9)	1	*6(6)*	1(1)	..	..	..	24
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	1(1)	..	..	..	1
Trachoma	..	..	..	1	..	..	24	..	25
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	22(12)	15(11)	13(7)	1(1)	8(6)	2	..	..	61
Typhoid Fever	..	..	..	1(1)	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	2(2)	..	..	..	..	..	..	..	2
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Notice.

INSTITUTE OF SCIENTIFIC STUDIES FOR THE PREVENTION OF ALCOHOLISM.

THE official opening of the first Australian Institute of Scientific Studies for the Prevention of Alcoholism will be held at 8 p.m. on January 18, 1960, in the Great Hall of the University of Sydney. Members of the British Medical Association who wish to attend should get into touch with the N.C.P.A. Secretary, 148 Fox Valley Road, Wahroonga, N.S.W., by January 11.

Honours.

NEW YEAR HONOURS.

THE following medical practitioners have been included by Her Majesty the Queen in the New Year Honours List:

Sir Charles Bickerton Blackburn, O.B.E., has been created a Knight of the Most Distinguished Order of St. Michael and St. George.

Professor Edward Ford, O.B.E., and Dr. William Wallace Stewart Johnston, C.B.E., D.S.O., M.C., E.D., have been created Knights Bachelor.

Dr. Timothy Joseph O'Leary has been created a Commander of the Most Excellent Order of the British Empire.

Colonel Richard Geoffrey Champion de Crespigny has been created an Officer of the Most Excellent Order of the British Empire (Military Division).

Dr. John Ralph Donaldson has been created an Officer of the Most Excellent Order of the British Empire.

Nominations and Elections.

THE following have applied for election as members of the New South Wales Branch of the British Medical Association:

Hart, Graham Hugh Basil, M.B., B.S., 1956 (Univ. Sydney) (subject to Section 17 (3) of the *Medical Practitioners Act*, 1938-1958), 3/148 Hampden Road, Artarmon, New South Wales.

Burkitt, Barbara Frances Emra, M.B., B.S., 1958 (Univ. Sydney) (subject to Section 17 (3) of the *Medical Practitioners Act*, 1938-1958), 8 Cecil Street, Gordon, New South Wales.

Gong, Lawrence William, M.B., B.S., 1959 (Univ. Sydney), 2A Mary Street, Auburn, New South Wales.

Armstrong, Michael Lawrence, M.B., B.S., 1960 (Univ. Sydney) (provisional registration), 6-46 High Street, North Sydney.

North, Robert Alan, M.B., B.S., 1960 (Univ. Sydney) (provisional registration), 24 Sutherland Road, Cheltenham, New South Wales.

Papaharalambous, Athanasios, M.D., 1940 (Univ. Athens) (registered under Section 17 (2A) of the Act), 511 Bourke Street, Surry Hills.

Deaths.

THE following deaths have been announced:

BURKITT.—Arthur Neville St. George Burkitt, on December 14, 1959, at Sydney.

BERG.—Max Berg, on December 16, at Brisbane.

HOWELL.—Frank James Howell, on December 22, at Hurstville, New South Wales.

DAHLENBURG.—Elgin Gustav Dahlenburg, on December 22, 1959, at Malvern, Victoria.

HEATH.—Leo Barclay Heath, on December 23, 1959, at Sydney.

LAHZ.—John Rudolph Sergius Lahz, on December 25, 1959, at Brisbane.

WILKINS.—Ernest James Wilkins, on December 31, 1959, at Wollongong, New South Wales.

Diary for the Month.

JANUARY 12.—New South Wales Branch, B.M.A.: Council Quarterly.
JANUARY 18.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
JANUARY 19.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JANUARY 21.—Victorian Branch, B.M.A.: Executive of the Branch Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

Authors of papers are asked to state for inclusion in the title their principal qualifications as well as their relevant appointment and/or the unit, hospital or department from which the paper comes.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, initials of author, year of publication, full title of book, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £6 *per annum* within Australia and the British Commonwealth of Nations, and £7 10s. *per annum* within America and foreign countries, payable in advance.